

3rd  
YEAR

# CHEMICAL WEEKLY

VOL. XXXIII

JULY 12, 1988

NO. 44

**DIAMINES'**  
world-class  
**EDA**

yielding

**INDOFIL'S**  
world-class  
**DITHANE**



**Diamines and Chemicals Ltd.**  
Manufactures EDA, of internationally accepted standards, which forms the basic raw material for fungicides vital for many a vegetation.

**Indofil Chemicals Company**  
in collaboration with Rohm n Hass, U.S.A., produces globally aproved quality DITHANE – a fungicide based on EDA entirely supplied by DACL.

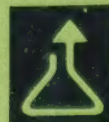
**Diamines  
and Chemicals Ltd**



HO : 1, National Chambers,  
2nd Floor, Ashram Road, Ahmedabad – 380 009.

WORKS : Plot No. 13, P.O. Petrofils,  
Baroda – 391 347

**INDOFIL**  
CHEMICALS COMPANY



NIRLON HOUSE, DR. ANNIE BESANT ROAD,  
BOMBAY-400 025 INDIA  
TEL: 4937391 CABLE: RHOTHANE TELEX: 011-71376  
Affiliate of Rohm and Haas Company, Philadelphia (U.S.A.)  
Division of Modipon Limited, Modinagar, U.P. (India)

(EDA manufactured according to NRDC process developed at National chemical Laboratory, Pune-8)





## Products for Textile Printing, Dyeing & Finishing



### ACRON PIGMENT EMULSIONS

For Printing and Dyeing on all types of fabrics.

### ACRON BINDERS

For Pigment Printing, Pigment Dyeing, Khadi, Gold, Flock, Fluorescent printing and Non-woven Fabrics.

### PIDIFIX FIXERS

Crosslinking Agents for increasing Fastness of pigment prints on Synthetics and their blends. Also for Khadi printing.

### PIDIVYLS

Polyvinyl Acetate Emulsions for use in Khadi printing and finishing of textiles.

### PIDICRYLS

Acrylic Co-polymer Emulsions for imparting soft to full body and durable finishes with good draping properties for Cellulosics, Synthetics and their blends.

### PIDIGEN SUPRA

Dye Fixing Agent — For increasing wet fastness of Direct and Reactive Dyes.

### PIDINONS

Non-ionic surfactants, Emulsifiers, Wetting Agents, Detergents etc.

### AUXILIARY CHEMICALS

For Finishing, Sizing etc.



PDI Chemicals Pvt. Ltd.

Marketing Division, Ramkrishna Mandir Road, off M. Vasanji Road,  
Andheri (East), P. B. No. 17401, Bombay-400 059. Phone- 6347550



**SILICA GEL** (INDICATING AND NON-INDICATING TYPE)  
**ACTIVATED CARBON** (POWDER/GRANULAR; CHEMICALLY ACTIVATED)

**ORTHO DICHLORO BENZENE**  
**PARA DICHLORO BENZENE**  
**ORTHO PHENYLENE DIAMINE**  
**BENZYL CHLORIDE/BENZOATE**  
**MONO CHLORO BENZENE**  
**TRI CHLORO BENZENE**

**Ortho Nitro Aniline**  
**Meta Chloro Aniline**  
**Para Chloro Aniline**  
**Butyl Stearate**  
**Octyl Stearate**  
**Octyl Acetate**

**Methyl oleate**  
**Cocoanut Di Mono**  
**Ethanolamine**  
**Magnesium Chloride**  
**Crystals**  
**Paraformaldehyde**

**ISO PROPYL MYRISTATE**  
**ISO PROPYL PALMITATE**  
**EDTA DISODIUM SALTS**  
**PEG 200, 400, 600**

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100, Dada Saheb Phalke Road,  
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BOMBAY - 400 014 (INDIA).

Tel.: 448051-448661

Resi.: 4221658



**IMPORTED RAW MATERIALS AVAILABLE  
WITH MODVAT & DUTY DRAW BACK BENEFITS  
From Ready Stock/Incoming Consignments on High Seas Basis**

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& FOOD INDUSTRY**

- \* PROPYLENE GLYCOL USP (DOW)
- \* AEROSIL -- 200
- \* PVP k-25, 30, 90 USP (Polyvinyl Pyrrolidone)
- \* TWEEN 80 USP
- \* ETHYL CELLULOSE NF/USP  
Grades: N-7/10, 20/22, 45/50, 100, 200
- \* HPMC (Hydroxy Propyl Methyl Cellulose)  
E-5, 15, 50, K-100, K-4M  
(Pharmacoat 606, 615, 650)
- \* MODIFIED CELLULOSE GUM (AC-DI-SOL)
- \* MICRO CRYSTALLINE CELLULOSE USP  
Grades: AVICEL PH-101, PH-102, RC-581
- \* HYDROXY ETHYL CELLULOSE  
(Natrosol 250 LR/GR/MR)
- \* CARBOPOL 934, 940
- \* SODIUM SACCHARIN IP/BP
- \* TITANIUM DIOXIDE (Pharma Grade)  
Rutile - RKB2 (Bayer)  
Anatase-3328 (Whittakar)
- \* GUM ACACIA IP (SUPERWHITE)
- \* PETROLEUM ETHER 40°-60°
- \* RESORCINOL (Japan)
- \* LACTIC ACID U.S.P.
- \* PARA CHLORO META CRESOL (PCMC)
- \* SOYA LECITHIN (Brazil)
- \* BHA/TBHQ
- \* VANILLIN/ETHYL VANILLIN
- \* DL-METHIONINE HYDROXY ANALOG  
(MHA 86%)

**PERFUMERY & FLAVOUR INDUSTRY**

- \* VANILLIN/ETHYL VANILLIN
- \* DI PHENYL OXIDE (USA)
- \* PROPYLENE GLYCOL (DOW)
- \* DI PROPYLENE GLYCOL (DOW)
- \* COUMARIN
- \* SANDELLA (IBCH)
- \* TWEEN 80 USP

**MISCELLANEOUS**

- \* TETRAHYDROFURAN (THF)
- \* 1:4 DIOXAN
- \* MORPHOLINE
- \* PYRIDINE PURE 2°C
- \* HYDROXYLAMINE HYDROCHLORIDE
- \* PETROLEUM ETHER 40°-60°
- \* N-METHYL PYRROLIDONE
- \* PROPARGYL ALCOHOL, 1:4 BUTYNEDIOL
- \* ETHYL CELLULOSE (ALL GRADES)
- \* N-PROPANOL
- \* MONO ISOPROPYLAMINE
- \* AMMONIUM PERSULPHATE
- \* POTASSIUM PERSULPHATE
- \* SODIUM BORO HYDRIDE
- \* SODIUM METHOXIDE
- \* ADIPIC ACID
- \* BISPHENOL-A
- \* ISOPHTHALIC ACID
- \* BUTYL TITANATE
- \* MODAFLOW RESIN MODIFIER

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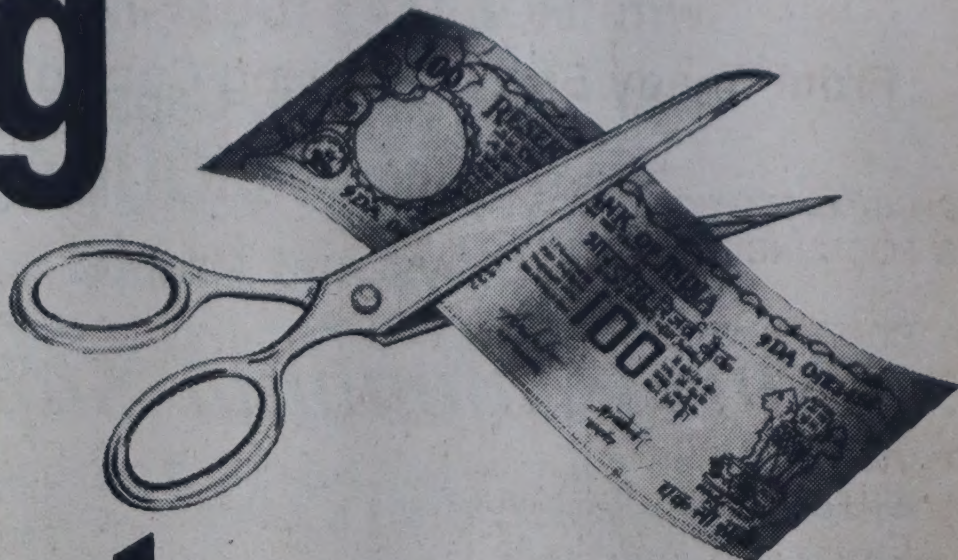
Telephone: 334290, 345910, 483892, 541412

Telex: 011-75197, 011-76664





# Cutting Cost Without Cutting People



FINE ORGANICS offer 100% concentrates for making your own Textile auxiliaries like SOFTNERS (Nonionic, Cationic, Reactive or Anionic), MERCERISING & WETTING AGENTS, PE & WAX EMULSIONS, SCOURING & WASHING AGENTS, SYNTHETIC PRINTING THICKENERS FOR Pigment, Reactive or Disperse/Acid Colour Printing, Replacements of Kerosene or Sodium Alginate, etc .

By using 100% Concentrates of FINE ORGANICS, you can bring down your auxiliary cost to half. Meet us for practical demonstration.

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PHONES: 5135356, 5135471, 5135687



Please Contact for Prompt Supplies Of:

# Anhydrous Ammonia Gas

In 5/7/9 Tons Capacity Road Tankers and

In 60/50/40 Kgs. Capacity Cylinders.

Also Available **LIQUOR AMMONIA**

In Carboys and Drums

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Vapi Office: Shed No. 19, C-1, B. Type, Vapi Industrial Estate, G.I.D.C., Vapi-396 195. Phone: 685.

Ankleshwar Office: J-3435, G.I.D.C. Estate, Ankleshwar-393 002, Gujarat State. Phone: 2449.

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Phones: 4948652/4948659/4946686

**benzyl alcohol** F.F.C./I.P.  
**benzyl acetate** F.F.C.  
**benzyl benzoate** I.P.

### INDUSTRIAL SEGMENTS SERVED

- ☐ Soap — Perfumery and Flavouring Industries.
- ☐ Photo Films Developing Industries.
- ☐ Textiles — Man-made Fibres.
- ☐ Printing Inks, Stencil Fluids, Pen Inks, Lacquers, Industries.
- ☐ Drugs and Pharmaceutical Industries.
- ☐ Cosmetic Industries
- ☐ Plasticizer Industries.

### USES AND APPLICABILITY:

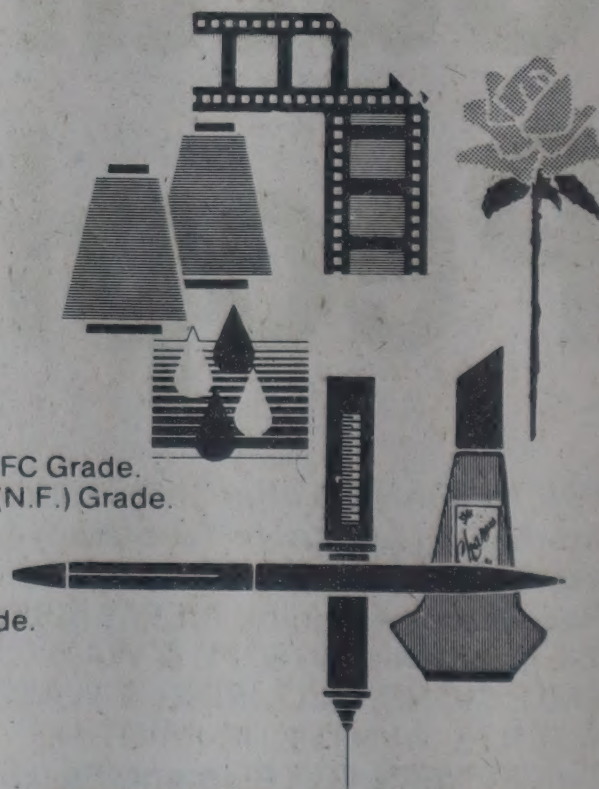
- ☐ Developer-Booster-Photo Films.
  - ☐ A Dyes — Carrier for Nylon Filaments.
  - ☐ In formulation of various types of Inks
  - ☐ For Preservation of all types of parenteral Solutions by an antiseptic/local anesthetic action-relieving preventing itching-Ointments Emulsions.
  - ☐ A Permanent crease fastner on Fabrics.
- Characterestics-a Colourless Pale Yellow Liquid.

### PACKING IN STANDARDS OF:

210 kgs/35 kgs in Plastic Drums/Carboys.

### GRADES:

- ☐ Technical Grade — FFC Grade.
- ☐ National Formulary (N.F.) Grade.
- ☐ Photo Grade.
- ☐ Reagent Grade.
- ☐ Textile Grade.
- ☐ Pharmaceutical Grade.



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Gram: Benzoates, Baroda, Phone: 361 (Nandesari)

### Bombay Office:

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Fort, Bombay 400 001, India  
Phone: 286 0026, Gram: Benzoates





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**96% A.D. DODECYL BENZENE SULPHONATE**  
(HARD ACID SLURRY)

**LINEAR ALKYL BENZENE SULPHONATE**  
(SOFT ACID SLURRY)

**SULPHONATED WITH SULPHUR TRI-OXIDE**

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Phone: 289, 291      Gram: AROCHEM SILVASSA

Telex: 0185 201 ARCM IN

- BOMBAY** : Scent House, Station Road, Goregaon (West), Bombay-400 062.  
Phone: 6722280, Gram: AROSILVASSA, Telex: 011-78077 FAIS IN
- KANPUR** : Chemdet Enterprises, Shop 67, 75/232, Sabji Mandi, Kanpur.  
Gram: SCENTOUS, Telephone: 64551
- MADRAS** : Syndet Enterprises, 90, Govindappa Naick Street, Madras-600 001.  
Gram: SCENTOUS, Telephone: 35532
- DELHI** : B. Shantilal & Co., 1025/5, First Floor, Gali Teliyan, Tilak Bazar, Delhi-110 006.  
Gram: INDOSIL, Telephone: 291 3973/0649

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***SPRAY DRIED 40%***  
***A.D. ANIONIC DETERGENT***  
***POWDER NEUTRAL-pH: 7-7.5***

**In Snow White Colour & Free Flowing**  
**Bulk Density below 0.3**

Manufacturers

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(Phone: 280)



CONSUMERS & EXPORTERS CONTACT FOR YOUR REQUIREMENTS OF

# DIMETHYL SULPHATE

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**METHANOL** ( $\text{CH}_3\text{OH}$ )

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Excellent Softener for Shirtings, Sultings and Dress Materials.  
Almost 90% Textile Processing Houses in Bombay are using OCTADEX EM

## STAINSOL VC

Stain Remover Against IMPOL XI of SANDOZ for Hand Spotting Jigger.  
Jet Dyeing and Beam-Dyeing use.

## VIKKAWHITE - PR

Fluorescent Whitening Agent for Polyester (Develops at low temperature)

## WHITE PASTE FOR KHADI PRINTING

On Cotton and Polyester/Cotton (Excellent fastness and withstands  
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NO CURING REQUIRED

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### OUR PRODUCTS : QVF type Glass

Vessels, Pipe sections, Reducers, Tees, Bends, Valves,  
Column Sections, Reflux Dividers, Heat Exchangers,  
Stirrers, Sight Glasses, Couplings and Teflon items  
and their installation.

### OUR SPECIALITIES :

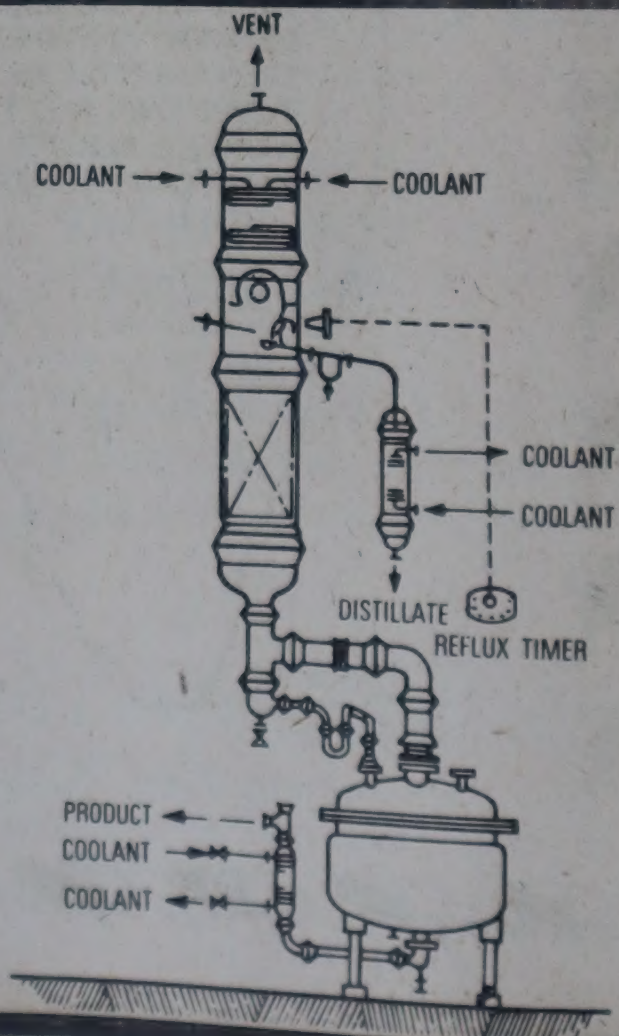
High Vacuum Reaction & Distillation Units  
Hcl Absorption/Generation/ Distillation Units,  
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*(Offers for sole marketing rights invited).*



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FERTILIZERS

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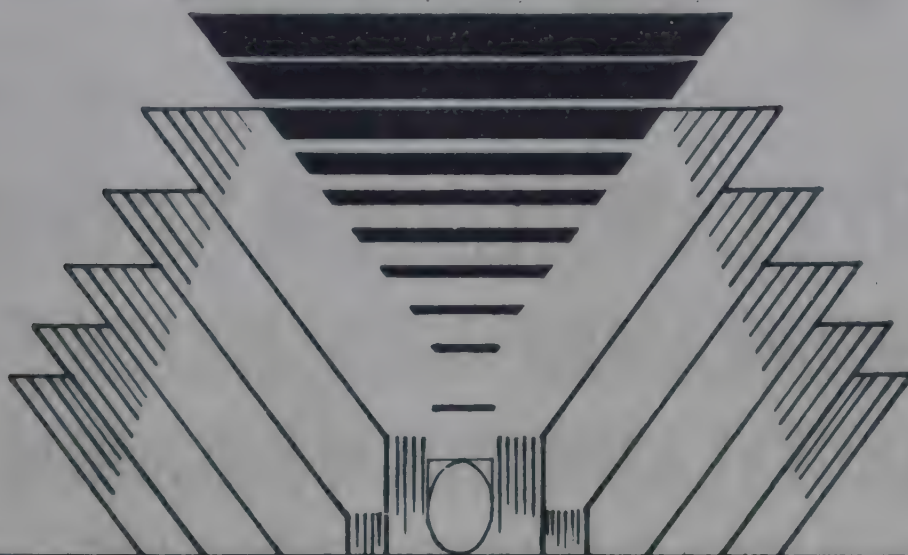
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DYES & INTERMEDIATES

OTHER INDUSTRIES

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Filter fabrics that are  
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**PYRIDINE GRADE 1 A (Min. 98.5%)**  
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**HYDRAZINE HYDRATE 80%**

**2-CHLORO PROPIONIC ACID\***

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**POTASSIUM CARBONATE 99%\***

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Telex: 11-2192 JAY IN

Hyderabad: Telephone Nos. 73604/70408





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unconscious formulation seems mind-boggling,  
but Nature does it regularly and effortlessly.  
It inspires us.

Process chemicals for the textile industry for Sizing, Desizing,  
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Titanium Dioxide  
Hydrogen Peroxide 50%  
Emulsifier Polyethylene  
Wax  
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M.E.K.

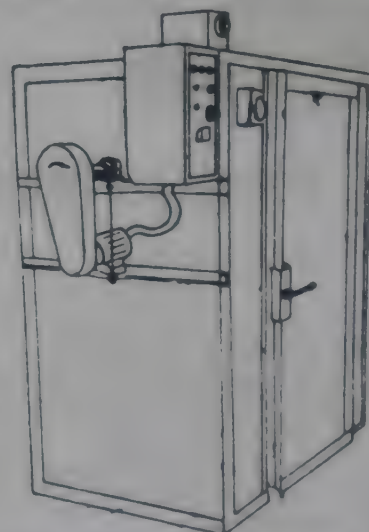
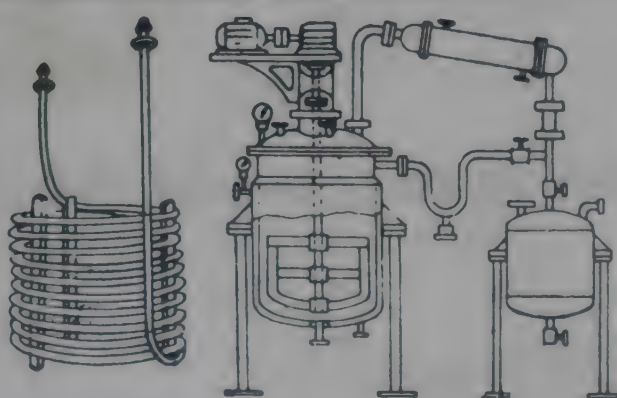
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## HEAVY CHEMICALS CORPORATION

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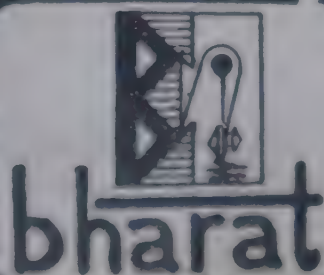
## BHARAT ENGINEERING WORKS

FACTORY- OFFICE: PHONE: 6982878

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BALARAM PATIL MARG

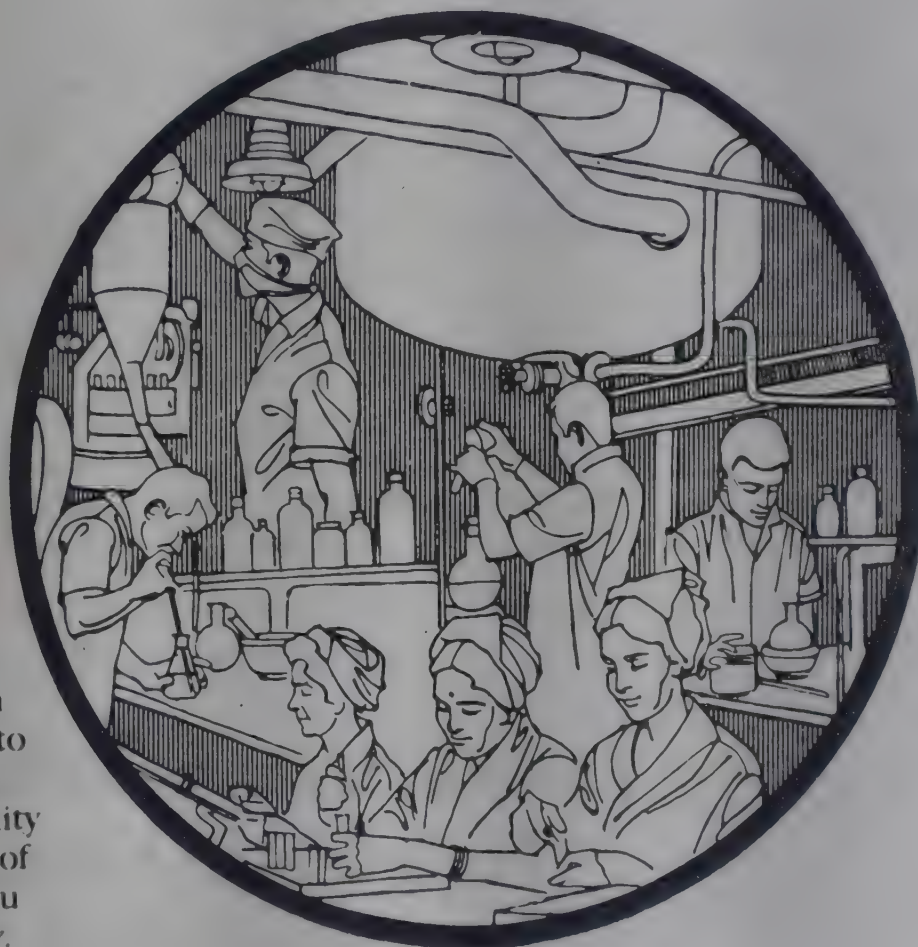
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- CHLORDIAZEPOXIDE IP/BP/USP
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- DIAZEPAM IP/BP/USP
- DOXYCYCLINE HYDROCHLORIDE/HYCLATE BP/USP

*For your requirements, please contact :*



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**\* Hydrochloric Acid \***

**\* Sulphuric Acid \***

**\* Oleum/Methanol \***

**\* H. Acid \***

**\* Benzidine Di Hydrochloride \***

CONTACT

**Sharp Trading & Finance Limited,**

3, Jafarani Mansion, 2nd Floor,

28, Kazi Sayed Street.

BOMBAY - 400 003.

Tel: 330778/320187/322408

Telex: 011-5822 USHA IN



# H.D.P. WHITE & BLACK JERRY CANS, CARBOYS & JARS

from PIL'S Virgin material  
manufactured on IMPORTED Machines



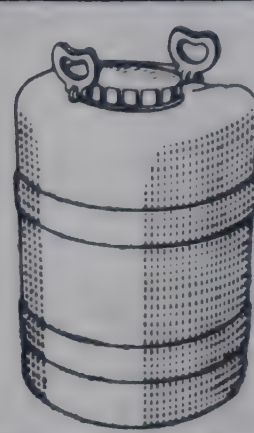
50 Ltrs. Jerry Can



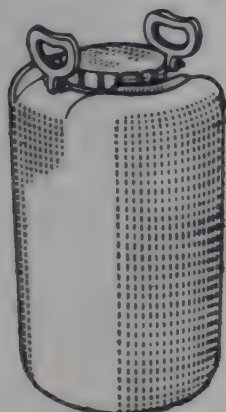
50 Kgs. Round Drum  
Full Top Open - 12" Cap



30 Kgs. Round Drum  
Full Top Open - 10" Cap



50 Kgs. Round Drum  
- 6" Cap



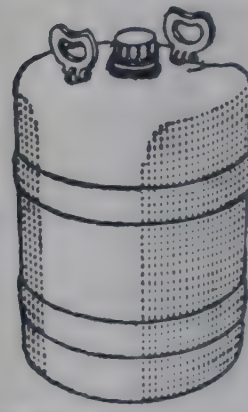
30 Kgs. Round Jar  
- 6" Cap



20 Kgs. Round Jar  
- 6" Cap



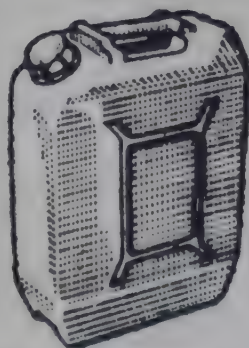
8 Kgs. Square Jar  
- 4" Cap



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- 2" Cap



30 Ltrs. Jerry Can  
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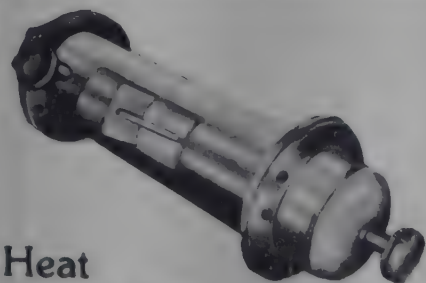
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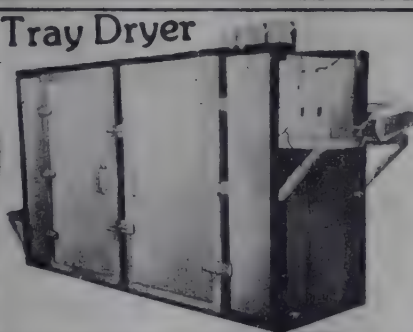
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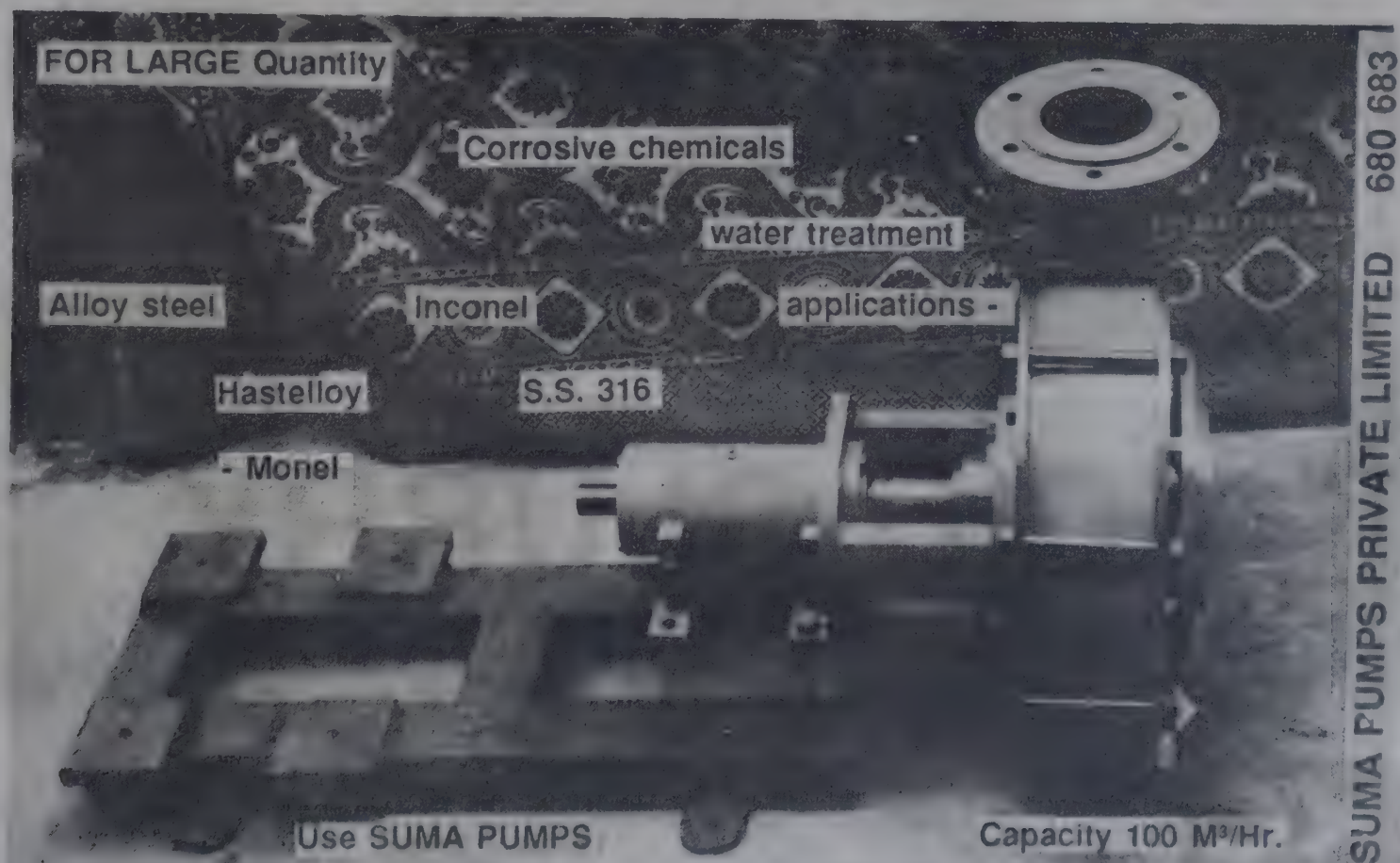
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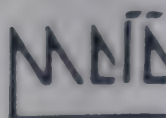
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# CHEMICAL WEEKLY

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## Tales Trees can Tell

Trees are living archives, carrying within their structure a record not only of their age but also of precipitation and temperature for each year in which a ring was formed. The record might also include the marks of forest fires, early frosts and, incorporated into the wood itself, chemical elements the tree removed from its environment. Thus, if we only knew how to unlock its secrets, a tree could tell us a great deal about what was happening in its neighbourhood from the time of its beginning. Trees can tell us what was happening before written records became available. They also have a great deal to tell us about our future. The records of past climate that they contain can help us to understand the natural forces that produce our weather.

Carpenters from time immemorial must have known that tree trunks have rings, which give rise to the grain in a piece of wood. We find them mentioned by associates of Aristotle, but Leonardo da Vinci was the first person to suggest that as trees grow, they add a new ring every year. Application of the study of tree rings began in the early part of this century with Andrew Ellcott Douglass early in this century (1901).

He was looking for evidence that the 11-year cycle of sunspots had been recorded in these rings. He didn't immediately find what he was looking for, but he did notice that the tree rings appeared to show the same patterns from one area to another.

Today, we understand that when spring arrives and vegetation comes alive after the dormancy of winter, the cells just inside the bark of a tree start to divide. They produce large, thin-walled cells that we see as the light coloured material scientists call earlywood. Later in the season, the growth slows down and the cells get smaller and thicker walled. This so-called latewood looks darker and is what makes up the dark rings in a tree trunk. After the latewood forms, the tree becomes dormant again for the winter and the whole cycle repeats. The result

is that many species carry in their trunks a series of alternating dark and light bands, each pair corresponding to a year's growth.

Douglass continued to study the patterns in tree rings. The technique he used, now known as cross-dating, was based on a simple idea. Suppose you found a particular sequence of growth rings; for example, fat, skinny, fat, fat, skinny, skinny, fat; suppose further that you found this sequence near the center of a tree that was cut down last winter; you know the outermost ring in the tree was formed last year, by counting backward along the rings until you come to the sequence, you could figure out when it started.

In the hands of tree-ring scientists, both of these pieces of information are valuable. The pattern in the rings back to the starting date can, with luck, be matched to that in still older trees, extending our knowledge of these patterns farther back in time. In this way people working with living and dead bristlecone pines have managed to construct a continuous record of tree rings back to about the year 6700 BC. At the other end of the scale, the date of the tree's death may be very important if the tree was cut down to be incorporated into a structure, for then the rings allow us to assign a fairly accurate date to the building.

In places with a long record of advanced civilizations, the use of tree rings can be unexpected and dramatic. For example, the citizens of medieval Novgorod (in northwestern Russia) dealt with the mud in their streets by putting down layers of logs. As each layer sank into the mire, it was replaced, until today there are no fewer than 28 streets stacked on top of each other, dating from A.D. 953 to 1462; a tree-ring paradise. In another case, paintings by such Dutch masters as Rembrandt and Rubens were dated by an analysis of the ring patterns in the oak panels backing the paintings.



But if the use of rings to date archaeological objects was the major task in the first half of this century, the analysis of information about past climates and chemical contents of the atmosphere is fast overtaking it in the 1980s. Perhaps nothing illustrates this application of new sorts of science to the tree ring so well as the continuing calibration of the carbon 14 dating system.

The idea is that plants and animals stop adding carbon to their systems when they die, so that from that point on no new carbon 14 is added and the old atoms start to disappear. Provided we know how many carbon 14 atoms were in the environment, then, counting the number left will tell us how much time has elapsed since the organism died. Using cross-dating between live and dead wood, it is possible to construct a continuous record of tree rings going back 9,000 years.

This was the situation in the late 1960s when C.W. Ferguson at the University of Arizona began attacking the discrepancy with the use of data from bristlecone pines. The idea was that we know the exact year in which the wood in a particular ring was formed, so counting carbon 14 atoms in that ring will tell us how many such atoms there were in the wood at the beginning.

All the uses of tree rings we have discussed so far in this article generally go under the name of dendrochronology (from the Greek *dendron*: tree, and *khronos*: time). The hot topic in tree-ring research these days is the field of dendroclimatology; the reconstruction of past climates and climatic events from evidence found in tree rings. The modern study of dendroclimatology was initiated by the work of biologist Harold Fritz in the University of Arizona in 1960.

The growth of a tree ring is not as simple as it might appear at first. If last year was a particularly good one for tree growth, for example, the root system of the tree might have expanded more than usual, and this will carry over into this year's growth. Similarly, a bad year might slow down the growth for several years in the future, regardless of the weather in those years. Sorting out all these effects for a system as complex as a living tree was a monumental task, but once it was done the results had as wide a variety of uses as did the establishing of chronologies.

Tree-ring specialists are also getting involved in studying the effects of acid rain on eastern forests. "This is a serious problem," says Columbia University's Gordon Jacoby, "but it is an area where we have to be very careful. First we have to establish what is actually happening to the trees, and only then will we be able

to think about causal relations. In some situations, however, trees rings can be used to document the effects of pollution in a very dramatic way. A group from the University of Arizona, for example, was able to see the effects of a lead smelter in Trail, British Columbia, on tree growth in Washington State. The growth was well below normal when the smelter was turned on, but then rebounded when the smelter was shut down a few years later.

Tree rings also record the explosive eruptions of large volcanoes. When an event like the blow-up of Mount St. Helena in 1980 happens, large amounts of ash and gases are known into the stratosphere. There the dust and gases block out parts of the sunlight that would normally reach the surface. This can lead to subfreezing temperatures and leave a characteristic mark called a frost ring on a growing tree.

Another type of transient phenomenon that tree-ring scientists are starting to study seriously is earthquakes. These events can damage a tree by shaking it violently, and the damage can result in narrower rings in subsequent years as the tree heals.

All of these examples illustrate an important point. When we want to study the information stored in trees, we cannot restrict our attention to single geographical areas or even to single countries. The International Project in Dendroclimatology (IPID) is one effort to move tree-ring studies into the international arena. Scientists from many nations have pooled their information in an attempt to reconstruct past climates around the world.

The practical significance of such research emphasizes the need for an international effort in tree-ring work. One scientist after another at the Laboratory of Tree-Ring Research talked of "blank spots on the map," and all mentioned that the laboratory brings in foreign scientists for training, then sends them out to set up programmes around the world. Perhaps someday we will be able to put together worldwide weather maps based on dendroclimatology similar to those that now exist for the western United States. If so, we will have added important data that are needed to understand how our climate and the living systems that depend on it interact.

Trees remember. And if we are clever enough, we can tap that memory to give us all sorts of useful knowledge about our past -- and our future.

(Extracted from an article by JAMES TREFIL of the University of Virginia, published in *Span*, Nov. 1986).

-- T.P.S. RAJAN.



# CHEMARENA

S.L. VENKITESWARAN

## Ethylene Oxide supplies in dire shortage

Most of the chemicals in the West including plastics are surging with record production and profits and plans for debottlenecking or expansions. But the devastating explosions at some centres have resulted in very acute shortages of acetic acid and even more so in ethylene supplies -- the basic feed for many polymers and chemicals. The ethylene shortage has led to a discrimination and selectivity in supplies for certain derivatives, particularly of ethylene oxide and its derivatives. This has led to a relatively greater shortage of these and far higher prices. MEG which at one time was not making any money is now priced at nearly double the 1986 levels and plants operating at 90% plus capacity have been obliged to cut to 75% or less. Bringing back old and idled capacities have added to the problems.

India is badly placed with soaring needs of MEG for its polyester plants and the two small plants are able to provide less than 30% of the requirements. Imports are so difficult to procure in the altered situation and spot prices are so high as to force (Ref. *CHEMICAL BUSINESS* of U.S.A., February 1988) Government to effect steep cuts in import duties which at one stage was a hefty 155%. Even after reduction to 40% the imported materials landed cost is higher than the price of the indigenous product. We find a strange situation of pooled price wherein the price of Indian product is raised to equalise the landed cost of imports -- the opposite of what is the invariable practice of pooling the lower landed cost with higher indigenous costs of production. It is difficult to envisage how far this situation will continue -- at any rate until more ethylene capacity in USA starts operating as USA has been a major exporter of MEG.

Indian situation is rather grim. The next plant of 20,000 TPA will be based in ethyl alcohol in a corner of UP and may be in production before the end of this year. This production whose economics were in doubt is now set in a happy situation for its output at a good profit and the base raw materials molasses is also abundant in the wake of a record of over 9 million tonnes sugar production and expected to be even higher in 1988-89. But the shortage will continue even after the Maharashtra Gas

Cracker Complex goes on stream late 1989. The capacity licensed to Reliance Industries is yet to be implemented for it is linked to the Gujarat Gas Cracker on which a decision is still pending and even Haldia is yet to get final clearance. Though Haldia has no programme for MEG, the additional production of polyolefines would ensure that ethylene oxide capacity does not suffer due to diversion of ethylene to a more lucrative polymer market by the producer -- consumers like IPCL, MGCC and NOCIL.

Ethylene oxide and glycol markets are diverse and shortages hit many downstream industries besides polyester fibre. India uses no antifreeze while USA uses 42% of MEG output -- about a million tonnes. Favourable and mild winter conditions reduce this outlet. 44% of MEG goes into polyester in USA -- in India, it is probably 85%. The balance 15% of MEG production -- about 6,00,000 tonnes is exported by USA, though there were also nominal imports into USA from Canada. DEG is a co-product of MEG to the extent of 8 to 12% of MEG and generally more profitable if it is sold as such instead of in an antifreeze mix. Polyglycols also have limited but profitable outlets.

Ethylene oxide has various other uses such as for ethanolamines, ethoxylated surfactants, glycol ethers etc. Surfactant demand is growing in U.S.A. and is reported to be 7,00,000 tonnes using 14% of ethylene oxide produced in U.S.A. Glycol ethers and acetates have varied special solvent uses and recently 2-butoxy ethanol seems to have found application as a coupling agent in water-based paints and coatings. About 5 to 6% of ethylene oxide goes into these derivatives.

Propylene oxide prices have not found the big upward thrust of ethylene oxide. Propylene oxide production in USA is confined to two giants -- Dow Chemicals who perhaps continue with their chlorohydrin process and ARCO the world leader with their original peroxide-linked oxidation technology. Propylene oxide output in USA is placed at about 1.4 million tonnes. The use of isobutylene obtained from coproduct of MTBE production has strengthened ARCO technology.



Propylene oxide prices have also gone up through to a lesser extent -- now to about \$ 1,500 per tonne. In Europe also the production is dominated by ARCO with ICI in UK and Atochem in France shutting down their units. Western Europe also produces at about the same level as USA -- 1.3 million tonnes. Apart from their technology yielding valuable coproducts, ARCO is also fully integrated to downstream products based on isobutylene and on propylene oxide. While MTBE is a large but cheap outlet, technology for conversion of isobutylene to methacrylate is at an advanced stage. Propylene

oxide is also readily reacted to yield 1:4 butane diol increasingly required for some polyesters. ARCO is also coming out with a non-calory fat substitute from propylene oxide and polystyrene.

India is yet to make a start on propylene oxide with schemes hanging on for some years. Even if implemented it is to be based on the chlorhydrin route and in small capacity leading to high costs. The wisdom of such a late start, with obsolete technology is questionable.

## Advanced Composites

Advanced composite materials are an attractive proposition for the future but progress is difficult. Apart from the resin composites, with diverse fillers or co-components, a host of advanced ceramics for high temperature performance have made their debut, but have yet to get over their inherent littleness. Such ceramics are materials which have no recycle value when compared to the thermoplastic resin composites.

A recent survey of such advanced materials and their potential by Strategies Analysis Inc., Reading, PA, USA for 1986-1996 projects a 7% growth rate for advanced ceramics to \$7.6 billion and 10% growth rate for polymer composites to \$3.4 billion. But the profits are said to be in the finished components and not in sale of materials. The figures do not count on ceramic engine parts or polymer-based batteries which may not make it to big markets by 1996. One advanced material of a different type is amorphous metals which have already made a big impact and was developed by Allied Signal Inc., Morristown, N.J. where molten alloy materials are chilled at an extraordinarily high rate of 1 million degrees per second so as to prevent any crystal structure to develop. Such materials have less resistance to magnetic cycling and hence are very useful for transformers where electrical losses can be cut by 60%. A million transformers are in use in USA and their replacement where feasible is to good economic advantage.

Aerospace is a big area for advanced composites (resins) and set to grow at 12% a year. Automobiles are the most obvious area for developments and much progress has been made. The cost of the whole system to turn out finished components for assembly is what is important and not the cost of materials *per se*. Automobile doors is a realisable target in the next 2 or 3 years. The cost of discovery and development is enormous. Amorphous metals or metglass is said to have cost \$100 million. Du Pont is said to have spent 20 years and \$700 million on Kevlar reinforcing fibre. The problems and costs on advanced ceramics and the special inorganic fibres ("whiskers") are very high and only the very large corporations can afford the costs.

The inter materials competition is also fierce -- particularly for engineering plastics to replace metals. Aluminium-lithium alloys are claimed to be difficult to edge out. Automakers can consider ceramics, intermetallics, ceramic composites, metal nitrides. Aerospace designers can choose to graphite, aramid, ceramic, glass for composites. Du Pont are probably the most advanced in these areas, more so due to the ability and facilities for design, produce, test and market the components. India's IPCL is planning to tie-up for engineering plastics with a foreign company and this step is badly needed and requires to be expeditiously pursued.



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## More delicensing on cards

Another dose of liberalisation of the industrial licensing system is in the offing. Considered by Industry Ministry officials as more bold and dynamic than the recently announced licensing changes, the new measures would exempt MRTP and FERA companies from licensing, provided they fulfil specified conditions of investment within a ceiling and given locations.

The Industry Ministry is now engaged in this exercise of finalising the proposed liberalisation measures. According to current indications, it may take a few weeks before these measures are given the final nod of approval for public announcement.

The new measures are, in fact, aimed at answering the charge being levelled by the big industry that all the recent licensing liberalisation steps are meant for the non-MRTP and non-MRTP and non-FERA companies. The only exception to this has so far been in respect of dominant companies, which have now been let off the licensing hook under the MRTP Act.

But this exemption covers only 69 companies, and that too when they invest in areas other than the industries in which they are dominant. A company's dominance is established if its assets are over Rs. one crore and if its share is more than one-fourth of the total market of the product it manufactures.

The new proposals will thus cover the remaining 1,363 companies whose assets are over Rs. 100 crores, in addition to the FERA companies. According to these proposals, the MRTP and FERA companies will not require any licence, if their investment is below Rs. 50 crores and is located in backward areas. Licensing requirement will be done away with for MRTP and FERA companies also for investment below Rs. 15 crores, if the location is outside the specified distances of 21 metropolitan cities.

In fact, the new measures would be an extension of the licensing liberalisation steps taken for non-MRTP and non-FERA companies on June 3, 1988 to cover MRTP and FERA companies. There will, however, be one major condition stipulated in this liberalisation measure.

This condition pertains to the area of operation by the MRTP and FERA companies. These large companies can now invest for manufacture of only in those items which are listed in Appendix-I of the industrial licensing policy. Appendix-I carries the list of core sector industries and the objective of this policy is to ensure that the large companies concentrate only in these high-technology basic areas.

Even in the proposed new liberalisation measures, the Government will not do away with the condition that MRTP and FERA will have to operate within the Appendix-I list. In other words, the licensing exemption for MRTP and FERA companies up to an investment ceiling will be provided within the existing broad licensing guidelines.

There are a few industries, which in the last two years have been thrown open to MRTP and FERA companies. These will continue to be open to the large houses in addition to the Appendix-I list of industries.

Official sources explain that once the MRTP and FERA companies also exempted from licensing, if they invest up to a ceiling and at certain given locations, the Government would reduce its licensing functions substantially and can concentrate on more important areas to promote industrialisation.

According to one source, the Union Industry will wield much less power in the months to come as its discretionary controls would be gradually withdrawn. Instead, the financial institutions would have more say in the setting up new projects, as they would have to examine whether they should fund a project or not.

### ALL-INDIA BOYCOTT OF GLINDIA PLANNED

The boycott of Glindia products, which started in West Bengal a few weeks ago by the pharmaceutical trade, is spreading to other parts of the country.

About 1300 stockists and wholesalers dealing in Glindia's products all over the country have decided to stop buying fresh stocks from the company from July 15. The retail chemists have planned to stop buying from July 30 and stop selling from August 15.

The All-India Organisation of Chemists and Druggists (AIOCD), the

apex body of retail chemists and a number of wholesalers' bodies, has not issued any circulars or notices for the proposed boycott as yet.

Informed sources in Bombay however point out that a decision to boycott Glindia's products on an all-India basis was taken sometime recently in Calcutta.

Glindia, with an annual turnover of around Rs. 300 crores, markets about 100 products all over the country. The share of pharmaceutical products alone accounts for Rs. 200 crores out of the total turnover.

Glindia currently pays a margin of 4.5 per cent to the wholesaler and stockists although the wholesalers' margin under the new Drug Price Control Order is only three per cent. The demand of the wholesalers and stockists is for a margin of eight per cent.

The wholesalers' demand for almost doubling of the currently paid trade margin would be a serious burden to the company. As it is, all drug units, including Glindia, have to pay a substantially higher margin of 16 per cent to the retail chemists under the new DPCO.

The retail chemists had stopped buying and selling products of Abbott Laboratories in Bombay and Thane a few days ago while in Marathwada region products of Unichem, Cadilla and Alembic are not being sold by the chemists demanding higher trade margin.

The chemists in Rajasthan, meanwhile, had stopped buying and selling products of Blue Cross Laboratories.

The sources point out that the new strategy of chemists and druggists boycotting products of a particular drug company without circulating any letter is in a bid to avoid action under Monopolies and Restrictive Trade Practices Act.

The main demand of the chemists and druggists is that the government should restore the retail trade margin of 17 per cent for price controlled formulations in Category I and 15 per cent for price controlled formulations in Category II on maximum retail price inclusive of excise duty. They also demand a higher trade margin for wholesalers in the DPCO.

Mr. H. K. Khan, secretary, department of chemicals and petrochemicals has convened a meeting of representatives of AIOCD in Delhi on July 6 to sort out the issue.



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## Fertiliser import bill may go up

India's fertiliser import bill this year is expected to be higher than that of 1987-88 on account of spurt in prices in the international market and the increased quantity that is slated for purchase from abroad.

According to official sources, the Minerals and Metals Trading Corporation (MMTC) has been asked to contract for the import of 1.20 million tonnes of nutrients — 0.25 million tonnes of phosphate and 0.95 million tonnes of potash. No import of nitrogen is contemplated this year in view of glut of urea in the country.

Last year India had imported 0.98 million tonnes of nutrients — 0.15 million tonnes of nitrogen and 0.83 million tonnes of potash valued at Rs. 175 crores.

This year the nutrient prices in the international market are 10 to 15 per cent higher over the last year's level. The spurt in prices has been attributed to the entry of China in a big way. This year China plans to purchase over six million tonnes of fertilisers compared to its normal purchase which ranges between three and four million tonnes annually.

The steepest increase in price has been in the case of urea in the global market. In July 1986, India had made its last urea purchase of about two lakh tonnes from the USSR for \$ 65 per tonne (f.o.b.) The current price is put at \$125 per tonne.

In fact, the prevailing urea prices are about 50 per cent higher over the last year's level of \$ 85 per tonne.

MMTC is believed to have already concluded contracts to meet this year's requirement of imported nutrients. The countries with which contracts have been signed include West Germany, GDR, Jordan, the US and Romania.

According to the Food and Agriculture Organisation (FAO) of the United Nations, India reentered the diammonium phosphate market in April with a tender for 50,000 tonnes for May-July shipment on which there were 19 bids offering 6,50,000 tonnes at prices ranging from \$ 174.47 to \$ 185 a tonne f.o.b. US Gulf.

Following the re-bids, India bought 50,000 tonnes at \$ 172.60 a tonne f.o.b. US Gulf. India requested another round of re-bids by those who offered

on the April tender and is expected to buy a further 2,50,000 tonnes in addition to some 1,00,000-1,50,000 tonnes to be obtained from Jordan, which in April was quoting \$200 to \$204 a tonne f.o.b.

The FAO report further says that following China's purchase of 400,000 tonnes of diammonium phosphate from a number of traders at \$172 to \$174 a tonne f.o.b. US Gulf, Phoschem, the US export sales organisation, sold 2,50,000 tonnes of this product to China at the end of April for June-September shipment at a reported price of \$172 a tonne f.o.b. US Gulf.

Phoschem also sold 200,000 tonnes to Iran for June-August shipment at the same price. Pakistan is to tender for 2,50,000 tonnes of diammonium phosphate for June/July shipment and subsequently an additional 70,000 to 80,000 tonnes for July/August shipment.

### GAS-BASED SPONGE IRON PLANT COMING UP AT HAZIRA

The first gas-based sponge iron project will come up at Hazira near Surat in Gujarat at a cost of Rs. 3.05 crores.

Set up jointly by the Gujarat Industrial Investment Corporation (GIIC) and Essar Gujarat it will have an annual production capacity of 880,000 tonnes.

The foundation of the project will be laid by the Union Steel Minister, M.L. Fotedar, shortly.

Sponge iron is a substitute for scrap, and today more than 2.5 million tonnes of scrap is being imported. Thus, the sponge iron project will also save the precious foreign exchange for the country to an extent of around Rs. 200 crores.

Addressing a press conference, Mr. S.K. Shelat, Managing Director of GIIC, said that the project is being implemented by Essar Gujarat Ltd., an associate of GIIC. The raw material in the form of iron ore/pellets will be transported by sea from Goa and Kudremukh region. This will involve a movement of approximately 14,00,000 tonnes of iron ore annually. For the purpose of receiving and handling iron ore, a special jetty is being constructed at the plant site.

The project will receive 8.5 lakh cubic metres of natural gas per day. A captive power plant of 30 mw has also been planned by the company.

The government has already given the necessary approvals and based on the present progress the project is expected to be commissioned by the end of next year, which would be 4/5 months ahead of schedule.

The project will employ the technologies of Midrex Corporation, USA and Voest Alpine of Austria. MECON are Indian consultants, he stated.

Mr. Ravi Ruia of Essar Gujarat observed that of the total world sponge iron capacity, 92 per cent is through the gas-based route and only 8 per cent through the coal based route. The country made a beginning in the field of sponge iron with the coal-based plants in Andhra Pradesh and Orissa. However, the technology of gas-based sponge iron has not been exploited so far in India.

### PANEL SUGGESTS 62% RISE IN DRUGS CONVERSION NORMS

The Dr. Sankaran committee has recommended a 62 per cent increase in the existing norms for conversion of bulk drugs into formulations, it is learnt.

The existing conversion norms were fixed in 1974 and the industry has been complaining that the cost of various inputs had gone up several times since then.

The committee had submitted its report in April after studying cost data from 30-odd companies representing a wide cross section of the industry including multinational, Indian and SSI units.

Conversion costs include expenditure on account of wages, maintenance, depreciation and fuel. The only area where the old rate has been scaled down is process wastage, following upgradation of technology.

The Government, after studying the committee's recommendations, is to notify the new norms. Companies will have to apply a fresh to get the benefit of the revised norms.

This will mean a fresh increase in prices over and above the higher mark-ups provided under the Drug Price Control Order, 1987.



## 27 more drugs may come under DPCO

The Union government may bring 27 more bulk drugs under price control, it is learnt. These would include all the 13 bulk vitamins and 14 other bulk drugs which are currently decontrolled.

All bulk vitamins such as vitamin A, vitamin B1, vitamin B2, vitamin C, vitamin E etc., are currently outside price control while the formulations based on vitamins are price controlled under the Drug Price Control Order, 1987.

The 14 other bulk drugs which are being brought under price control are: Dexamethasone, dipyrindamol, nifedopine, nikethamide, propranolol chlorpropamide, glipizide, phenoformin, tolbutamide, morphazinamide, totaguina and cinchona febrifuge, mepacrine, vincristin and vinflantin.

With the plan to include 27 more drugs under price control the basket of price controlled drugs goes upto 192 now under the 1987 DPCO. Yet over 200 bulk drugs are outside the purview of price control.

The government had already exempted these 14 bulk drugs from excise duty as they are considered as essential drugs. These drugs would be thus classified in category I of the DPCO. There are already 26 bulk drugs in the category at present.

It appears that the government plan to include all bulk vitamins under price control is guided by two factors.

Firstly, as the formulations based on vitamins are price controlled, decontrol of bulk vitamins will not make it rational as it would unfairly hit the formulations.

In fact the government had already noticed a spate of unwarranted price hikes by many leading manufacturers of bulk vitamins in the last few months. In quite a few cases, the government had also to intervene and drug units had to roll back the prices subsequently.

Secondly, it is being recognised now that many of the vitamins like vitamin A, vitamin E etc., are essential drugs. The medical profession also considers that multi-vitamin preparations should be taken along with antibiotics and other life-saving drugs.

The government had also made it clear when it announced the new DPCO in August last that it would bring any drug under the purview of price control as and when it is convinced

The Kelkar Committee, set up for categorisation of drugs, is yet to submit its report to the government. The Committee had received representations from 25 drug units seeking shifting of 33 drugs from price control. It is likely that drugs like paracetamol and diazepam would be taken out of price control as they are not considered essential drugs.

### PROGESTERONE, ESTROGEN SALE & MANUFACTURE BANNED

The govt. on June 30th banned the manufacture and sale of high dose formulation of estrogen and progesterone (EP) drugs considered harmful, specially if taken by pregnant women.

The ban follows public hearings of concerned groups held in Madras, Bombay, Calcutta and New Delhi in pursuance of a Supreme Court order in November 1986.

A notification issued under the Drugs and Cosmetics Act said the manufacture and sale of "fixed dose combination of estrogen and progesterone" (other than oral contraceptives) containing per tablet estrogen content

of more than 50 micrograms and of progesterone content of more than three milligram has been banned."

According to an official release, the drug controller of India, in pursuance of an order of the Supreme Court in November 1986 had held four public hearings of the concerned groups.

The ban was recommended on the basis of the evidence obtained at these hearings, benefit-risk considerations the apparent trend of misuse of high dose EP formulation, the advice of the Indian Council of Medical Research (ICMR) and opinion obtained from the Food and Drug Administration, United States.

The press release said presidents and secretaries of gynaecologist and obstetrician associations, voluntary health associations, consumer groups, representatives of women organisations and doctors gave oral and written evidence at the public hearings held by the drug controller.

Drug manufacturers also submit their technical data.

The Supreme Court order for a public inquiry was in response to a public-interest writ petition pleading for a ban on the drug.

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Dr. O. P. KHARBANDA

# Frankly Speaking

DR. O. P. KHARBANDA

Cost &amp; Management Consultant

601, Olympus, Altamqunt Road, Bombay-400 026.

(An author of repute and a visiting professor, Dr. Kharbanda consults worldwide including to UNIDO)

## Expectations and Motivations

How to motivate individuals? Despite a whole range of theories and a host of empirical studies, motivation and how to achieve it remain an extremely complex and difficult subject. Taking the case of an individual, the work situation and the larger environment, an Expectation-Motivation-Performance cycle is now emerging. Work behaviour seems to begin with expectation. Higher expectation leads to higher motivation and thereby better performance according to the equation:

Performance = Motivation X Ability X Necessaries

Necessaries represent resources, information, budgets, organisation structure and procedures. All these factors are provided for and affected by management, but a company's structure and procedures have a great influence on the timely provision of necessities. At the action level, of course, manager has the most influence on motivating his team and thereby on their performance. Motivation and performance are also seen as a direct function of the manager's expectation of his team, a low output results from low level of expectation. This has been confirmed by researches of the psychologist Rosenthal and his team. A group of rats drawn from the same strain were divided in two arbitrary parts, one labelled 'bright' and the other 'poor' in terms of intelligence. Two groups of experimenters were assigned the task of teaching these rats to run a maze. Findings confirmed that rats believed to be 'bright' did well and those arbitrarily labelled 'poor' did very badly. The results created a lot of laughter and even furor, but undaunted by it, Rosenthal and co-workers repeated their study with children in an elementary school in South San Francisco. Under the ruse of a new and unfamiliar intelligence test, five students from each class were arbitrarily designated as 'spurters' and their list casually given to their respective teachers. All the classes were subjected to

a standard IQ test three times during the year. The 'spurters' showed the greatest increase in verbal IQ, reasoning IQ and total IQ.

The rats and the children rose to high levels of intelligence merely because of the expectation of the experimenters and teachers. Perhaps the same applies at the workplace. Although there has been no formal study of this, experience at the workplace has borne out this hypothesis. A person expected to perform well, does indeed do so specially when he is conscious of the fact that his manager has high expectation of him. In so doing, he is really living upto his manager's expectation and thereby achieves a sort of self-fulfilment. He cannot let his manager down and in the process he assures for himself a rapid rise in the hierarchy. To be effective, of course, the managers expectation have to be constantly and continuously high and there must be constant feedback to the person concerned. This expectation-motivation-performance model suggests the following practical guidelines for managers:

Establish realistic expectation, also a fair reward system.

The first assignment should be tough and demanding.

A formal and long-term training program has dubious value.

\* Salary and the like must be equitable. They are never 'secret'.

First experience at the workplace has a considerable influence on later performance, and here a manager's role is most important. The real source of power rests with individual managers who alone can influence performance of their team members. The frequent and even daily feedback can ensure maintaining high expectation and therefore high motivation and performance. As simple as





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## Bombay high oil wells going dry

Delays in scheduled internal water injection have caused decline in oil production at Bombay High north oil field and a sharp rise in the number of gas-oil ratio (GOR) and sick wells.

Of about 150 wells in the field, as many as 40 have high gas-oil ratios and another 50 are in the category of "water cut" and "sick wells".

These are the findings of the Institute of Reservoir Studies (IRS) of the ONGC after analysing the current condition of the development of Bombay High north oil reservoir. It points out to the damage already caused to the oil reservoir, even as the development of oilfield remains incomplete.

This is a disturbing development on the country's current petroleum scene now characterised by stagnant production of crude oil, no let up in the consumption of petroleum products and heavy dependence on imports to improve overall availability.

The average production at Bombay High north oil field was only about 1,10,000 barrels of oil per day (BOPD), in the past two years against the

anticipated production of 1,20,000 BOPD.

A plateau annual rate of production of 1,44,000 BOPD is now possible only for two years from January 1989, according to the institute's analysis. The field was to produce 1,25,000 BOPD from January 1, 1983 for five years, according to earlier projections made by the institute and the French consultants CFP.

Even this revised peak production rate could be achieved, only with adequate internal water injection work over of the sick wells and installation of artificial lift facilities at the oil wells.

Although the IRS analysis report was submitted in August 1987. The ONGC has not so far acted upon the recommendations made by the institute.

The proposed infill drilling of wells and overproduction of wells to sustain targets without a matching water injection could prove suicidal for the Bombay High north oilfield.

The low rate of oil production, the report says, is due to the increasing number of high gas-oil ratio wells, water cut and sick wells.

The institute has warned that the number of high gas-oil ratio wells is expected to rise in the coming years, unless internal water injection becomes effective particularly in the undrained areas of oilfield.

ONGC was scheduled to commence internal water injection from January 1, 1986 to compensate withdrawal of oil from two layers of the reservoir. However, due to some unexplained reasons the scheme of water injection has not been implemented so far, according to the report. The schedule of water injection was earlier recommended by the French consultants — CFP and the ONGC's institute of Reservoir Studies based in Ahmedabad.

The average gas-oil ratio which was 300 in April 1986 increased to 415 by April 1987.

After detailed analysis of the performance of the oil reservoir the institute has posed the question whether one should produce a small quantity of oil at the cost of large amount of gas energy, which will result in lower oil recoveries from the field. "Over-producing high gas oil ratio wells and flaring of the gas does not justify the benefits derived from oil production," according to the institute analysis.

Low level of reservoir pressure and higher gas production will lead to lower ultimate recovery of oil from the field, warned the institute.

In general, already oil production from the field is lower than predicted value, the maximum difference is 30,000 BOPD in the third quarter of 1986.

To arrest further fall in reservoir pressure and to control the increasing gas oil ratio in wells the institute has recommended immediate implementation of internal water injection and strict adherence to the time schedule for artificial lift for wells.

Further, gas producing layers of high gas-oil ratio wells should be identified by conducting production logging and isolated to improve the oil productivity. If it is not possible to isolate the gas producing layers in wells, they should be closed.

The production target for Bombay High for the current financial year is 20.88 million tonnes.

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## India to export 40,000 tonnes LAB

India, which has been importing linear alkyl benzene (LAB), will now export this commodity for the first time this year.

The domestic LAB producers have been allowed as a special measure to export upto 40,000 tonnes this year in view of the excess supply position.

The major quantity is expected to be exported by Reliance Industries but the other producers — Tamil Nadu Petro-Products Limited (TNPL) and IPCL — also have surpluses available for export.

Taking advantage of the firming up of petrochemical prices in the international market, the indigenous producers are expected to net foreign exchange of the order of Rs. 56 crores.

The one time export has been made possible, official sources at New Delhi explain, because of sizeable imports of LAB last year by users like Hindustan Lever and

Nirma. Since these companies have sufficient stocks in hand, lifting of the indigenous production has been lower than anticipated.

It is expected, however, that this surplus situation will only be a temporary phase. Apart from the fact that imported stocks will soon be liquidated, the demand for LAB is also expected to pick up significantly.

Till recently, the only producer of LAB in the country was IPCL which has a production capacity of 30,000 tonnes per annum. In December, 1987, Reliance Industries and TPL also commenced production of LAB. These companies have a capacity of 60,000 tonnes each bringing the total annual production in the country to 1,50,000 tonnes.

Although imports by the State Trading Corporation were stopped in the beginning of this year, the major consumers already had sizeable stocks of the imported LAB.

view of adverse weather conditions affecting Chinese menthol supplies

and the reported delay in the Brazilian crop.

In the US menthol is widely used by cigarette manufacturers to produce mentholated cigarettes. Almost half the US menthol market is accounted for by the tobacco industry. The item is also widely used in the manufacture of pharmaceutical and cosmetic products.

Of late, synthetic menthol has been trying to make inroads into the market because of its cheap price and regular supplies. But the consumer preference for natural flavourings still maintains a strong demand for a naturally produced menthol.

**P.M. SINHA**

Mr. P.M. Sinha has been elected the new President of Indian Soap & Toiletries Makers' Association.

At the 54th annual general meeting of the Association held at Bombay on 30th June, the following were elected: Mr. P.B. Bharda (Vice President) and Mr. P.S. Pai (Hon. Treasurer).

## India exports menthol to the US

India has made a break-through in the export of menthol to the United States. During 1987, shipments of Indian menthol amount to over 1,000 tonnes.

The quality of the Indian product is reported to be acceptable to the discerning American consumers. It is also stated that Indian menthol is priced reasonably and competitively with Chinese menthol.

The US is a major importer of menthol, among other essential oils such as mint oils, citrus oils and terpenes. During 1987, USA imported 1368 tons of menthol valued at about \$ 16 million as compared to 1,60 tons valued at \$ 15.4 million in 1986 and 881 tons valued at \$13.3 million in 1985. Major origins from where the US imports menthol are Brazil, China and Japan.

According to the US Department of Commerce, larger shipments of Indian menthol are anticipated to enter the US market this year. The shipment of 9 tonnes valued at \$ 1.04 lakhs in 1987 is a small beginning and there is possibility of a large market opening up for the Indian product.

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## McDowell ABS project

There has been a 100 per cent rise in the project cost of (expansion of capacity) acrylonitrile butadiene styrene (ABS) being put by the McDowell group in Visakhapatnam.

Originally the project was approved with an outlay of Rs. 1400 lakhs, which has now been revised to Rs. 2844 lakhs.

The reasons cited by the company for this escalation are (a) The plant is now being built outside the existing premises, (b) the technology is now being imported as against the indigenous one envisaged earlier, and (c) the quantum of imported equipment has gone up as a result of imported technology and other consequential increase.

Satisfied with these new developments, the Central government has also approved the revised project cost and asked the company to go ahead with its expansion of the ABS with 5000 TPA.

The project cost will be met by internal generation (Rs. 591 lakhs), debentures (Rs. 1464.45 lakhs), and fresh equity (on right basis) of Rs. 788.55 lakhs.

The company has, however, been told to ensure that the holding of the promoters' group, namely, directors, inter-connected undertakings, etc. in the equity capital of the company shall be reduced by at least 40 per cent of the equity within a period of two years by offering shares to the general public.

### CENTURY ENKA

Another company, Century Enka Limited, has also received project cost for effecting expansion of polyester filament yarn.

The project, situated in Pune, envisages increasing the capacity from 6,540 TPA to 15,000 TPA.

The original cost of the project, as approved by the government, was Rs. 2,300 lakhs and the present green signal is for an outlay of Rs. 3,505 lakhs.

The increase in the cost was due to price escalation and change in design, change in foreign exchange rates and increase in raw material costs/import duties.

The outlay will be met by internal generation of Rs. 1736 lakhs (as against the original Rs. 870 lakhs).

loans amounting to Rs. 1000 lakhs (against Rs. 290 lakhs originally proposed) from banks/FIs and foreign exchange loan amounting to Rs. 769 lakhs (against Rs. 850 lakhs).

Interestingly, the company seems to have dropped the idea of going in for debentures as planned earlier. Whereas in the original scheme of finance it was proposed to raise Rs. 290 lakhs as debentures (out of a total project cost Rs. 2,300 lakhs) there is no such proposal in the proposed scheme of finance.

### YOKOGAWA KEONICS TO MAKE PROCESS CONTROLS

Yokogawa Keonics Ltd., a joint venture company promoted by Karnataka State Electronics Development Corporation and Blue Star Ltd., and Yokogawa Electric Corporation Japan, proposes to manufacture and market process controls.

To start off, the manufacturing will include the 'Centum' distributed process control systems and YS-80 single loop instruments. Most of these instruments and systems are widely used in various petrochemicals, refineries and fertiliser companies, in the country.

The company hopes to begin manufacture of these instruments this year itself and hope to indigenise the whole system in two years time.

The company is reported to have procured orders worth Rs. 18 crores for their instruments, from various Indian fertiliser and refinery companies.

### HOC'S CAUSTIC SODA PROJECT TO BE REVIVED

Hindustan Organic Chemicals Ltd. (HOC) has decided to revive its caustic soda project. The company has been holding a letter of intent to produce this basic chemical. Plans are afoot to erect a 100-tonne per day plant at Rasayani.

Caustic soda is the main product and chlorine is looked upon as a by-product, as the latter does not have a sizeable market, in the country.

HOC's objective in setting up the plant is to tap chlorine which goes into a number of its products. It is expected that HOC and Hindustan Insecticides Ltd. (HIL) together could consume almost 80 per cent of the chlorine production of the proposed plant.

HIL uses chlorine in the manufacture of DDT, the well-known insecticide.

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## Polymer units contemplating price hike

The indigenous polymer manufacturers are contemplating a fresh hike in prices.

The chiefs of National Organic Chemical Industries Ltd. (NOCIL), Polyolefin Industries Ltd. (PIL) and Indian Petrochemicals Corporation Ltd. (IPCL), who were members of the delegation which called on European and American manufacturers in April, are allegedly using the intelligence they had gathered to promote their own business interests.

The Government had arranged the tour to locate manufacturers who are willing to supply plastic raw materials like low density polyethylene (LDPE), high density polyethylene (HDPE), polyvinyl chloride (PVC) and polystyrene (PS). The Indian processing and consuming industries depend on imports for more than 60 per cent of its requirements.

Following the squeeze on international ethylene supply and alleged cartelisation by manufacturers, the global prices have been steadily soaring and the material is seldom available even at the high prices.

The Government had requested participation of indigenous manufacturers not only because of their knowledge of the world polymer scenario but in the hope that the foreign connections of some of them (NOCIL with Shell and PIL with Hoechst) will help secure firm commitments from European manufacturers.

This judgement proved correct and the team was able to secure promises for the supply of around 3.15 lakh tonnes of various polymers. Intelligence as to how much could be imported at what time and what price have emboldened the Indian producers to think in terms of a fresh hike in prices, it is learnt.

### ADVISORY BOARD FOR SALT REVAMPED

The Union government has reconstituted the Central Advisory Board for salt under the chairman-

ship of Mr. M. Arunachalam, Union minister of state for industrial development.

The Board has 28 members who represent salt producing states — Gujarat, Andhra Pradesh, Tamil Nadu, Rajasthan and Orissa. It also includes representative from Assam, UP and North-East.

Members representing marine sources, inland sources and Alkali manufacturers are also on the Board. Those with knowledge and experience of salt manufacturing in co-operative societies and in public affairs have been included.

In addition, it includes government officials from industrial development department, Central Salt and Marine Chemical Research Institute, Bhavnagar and the railways ministry.

The Board will have three year term and will advise the government on administration of proceeds of salt cess levied under Salt Cess Act.

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## IPCL preparing feasibility report

Indian Petrochemicals Corporation Ltd. (IPCL) is engaged in the preparation of a feasibility report on the proposed Vizag naphtha cracker complex jointly with a Japanese consortium of firms headed by Mitsui and Co.

Recently an eight-member Japanese team was at Hyderabad to hold discussions with the State Government and visited Vizag to examine infrastructural facilities as well as sites there. IPCL has also applied for a letter of intent.

According to preliminary projections made by a State Government appointed committee, if the work on the project commences in 1990-91, the complex would be got ready by 1994-95, the terminal year of the eighth Plan. The Centre has, however yet to finally accord approval to the Rs. 1,850-crore complex and include the same in the next Plan.

A number of big business houses in the country like the Mafatlals, Grasim, Hindustan Polymers of Vijay Mallya group all made a beeline last year for participating in the proposed complex.

The State Government after careful examination is understood to

have veered round to the view that none of the parties in the private sector would be able to meet the task.

The experience of Haldia refinery complex is being cited as an example. Enquiries made in official circles revealed that the promotion of the petrochemicals complex was handled at a senior level by Dr. N. Bhanu Prasad, Chairman of APIDC, and Mr. V.K. Srinivasan, Secretary (Petrochemicals) in the State Industry Department, with interaction at highest levels both in the State and the Centre.

After detailed discussions the State Government is understood to have made the first offer to Hindustan Petroleum Corporation Ltd (HPCL) to participate in the project. However, HPCL is understood to be more keen on the Mangalore project.

Later the Government decided to involve only a Central public sector organisation and requested the Centre to suggest any suitable party. Just at that time IPCL had shown keen interest with the then chairman of IPCL, Dr. Ganguli,

initiating preliminary moves in this regard.

Even as the Centre is yet to clear the project, the State Government has initiated a number of measures to provide infrastructural facilities in and around Vizag. When contacted, officials have discounted reports that the Centre has asked the United Breweries group to apply for a letter of intent for the cracker complex. The sources said it is "untenable and unlikely" that the Centre would ask a private sector firm to apply for LI beforehand. It would only make an assessment of all applicants based on their technical and resource competence. IPCL is stated to be the ideal choice for Vizag complex.

### ICI PLC MERCHANTING AWARD

Mr. Sandeep Chatterjee, the Bombay-based Export Manager of Imkemex India Ltd. received a Certificate of Merit as Runner-up for the ICI PLC Chairman's Merchenting Award for 1987.

The ICI Group of Companies merchenting business is carried out in 40 countries and achieves a turnover of about £500 million. Imkemex India Ltd., a recognised Export House, is a member of this worldwide commercial network which uses ICI's significant strengths to market the complementary products of other manufacturers. This merchenting activity is carried out under the banner of 'ICI Tradeway' and the focus throughout is on greater market and customer orientation.

The Chairman's Merchenting Award is presented annually to the person from the 'Tradeway' network who has contributed the most in the development of profitable merchenting during the year.

Mr. Sandeep Chatterjee, runner-up for the 1987 Award, has several significant achievements to his credit. He identified a key thrust area for Indian exports at an early stage, and developed supply sources well in time for Imkemex to take advantage of the export potential. He also achieved significant diversification of the company's existing export product range and developed several lines of import business into exports on a conversion basis. Perhaps the most complex and difficult task was the successful completion of some counter-trade deals, which require prolonged negotiations and co-ordination with several

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# FACT caprolactam to hit market next year

The Rs. 315-crore ammonium sulphate caprolactam project of FACT (The Fertilisers And Chemicals Transport Corporation Limited) is fast nearing completion and FACT's caprolactam is expected to be in the market by early 1989.

The project has just completed a significant year in its construction phase and has achieved more than 10 per cent overall progress. The construction activities at the site are at their peak right now, with about 1,000 workers, supervisors, engineers and other staff engaged in various activities. The project, with a targeted capacity of 50,000 tonnes of caprolactam and 2,25,000 tonnes of ammonium sulphate per annum, will help save foreign exchange worth Rs. 150 crores every year through import substitution.

FACT's entry is bound to have a significant impact on the caprolactam scene in the country. Till now the demand for caprolactam has been growing steadily, but indigenous production was lagging behind. Though Gujarat State Fertilisers Company (GSFC) started producing caprolactam in the seventies with an annual capacity of 20,000 tonnes, the gap between demand and production continued to widen. This benefited caprolactam producers in foreign countries.

Normally, this scenario should have prompted new ventures to manufacture caprolactam in the country. While the demand was growing, fresh production capacities did not get established, because of several constraints. The foreign sellers could virtually dictate terms to India. While the downward fluctuations in prices in the international market did not reach the Indian market, the upward swings in the prices were passed on fully to the Indian consumers.

The entry of FACT with a production capacity of 50,000 tpa will bring about a refreshing change in the scene.

However, present trends in the nylon industry, for which caprolactam is the main raw material, indicate that by mid-nineties, there will be a near saturation in the demand for caprolactam. For, in addition to the fresh production capacity of 50,000 tpa from FACT, an additional quantity of 50,000 tpa is expected to come in the market by 1993 after the expansion of GSFC. Despite the very rosy official projections of demand for caprolactam, actual

trends indicate that the growth is limited to the tyre cord segment of the nylon industry. Even here, some deceleration is expected, since the change-over from rayon to nylon, which contributed to the growth rate in the past few years, has reached the saturation point.

Large industrial houses like JK,

## HALDIA FERTILISER COMPLEX

### Toyo engg., UHDE to submit reports soon

Toyo Engineering of Japan and UHDE of West Germany are to submit to the Union government the final reports on Haldia fertilizer complex by mid-July, according to informed sources.

Early this year, the Union government entrusted these two foreign firms with the job of end-to-end survey of the complex which is awaiting commercial run over a decade. A massive Rs. 550-crore complex with a total workforce of 2500 is lying idle on the sprawling 210-hectre site on the bank of the river Hooghly.

The Japanese firm is surveying the three major plants namely, ammonia, urea and methanol while the survey of the downline plants and the rest of the whole complex is

Shri Ram and Modi are among those interested in establishing fresh capacities for caprolactam. Near saturation level is likely to be reached with FACT and GSFC plants going into production. The FACT plant is based on a technology from a single source — that of DSM, whose material is already well-established among the caprolactam users in India.

being undertaken by the West German firm. The foreign firms started work from around March this year and have already submitted the preliminary reports.

Hindustan Fertiliser Corporation, if the preliminary reports are any indication, might be required to invest a hefty sum to put the Haldia complex back on rails. Lopsided planning, poor erection and design, premature attempts for technological indigenisation, managerial inefficiency and capping it all, irresponsible labour have bedevilled the project ever since 1972.

Asked how long will it take to recommission the complex, HFC sources point out that much will depend on the size of investment to

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be made under the rehabilitation programme. The final reports will indicate the total amount required. If the government is prepared to provide the full amount, then recommissioning of the first phase could be achieved within a year of starting the rehabilitation programme and the recommissioning of the whole complex within two-and-a-half to three years.

If on the other hand the foreign experts recommend too big an investment and the government is not prepared to release the full amount, then adjustments have to be made and priorities rescheduled depending

on the amount of money to be available, the sources add.

HFC sources, therefore, are not sure at the moment about the size of investment to be made. The date from which the work of rehabilitation of the plant will start and the time by which the programme will be completed will depend on the amount of money the government will be ready to provide for the evamping of the complex.

However, HFC sources make it clear that there is not immediate plan to revamp the soda ash plant as it is unimportant in the whole complex.

## Chemexcil exports touch Rs. 783 cr.

Exports of the Basic Chemicals, Pharmaceuticals and Cosmetics Export Promotion Council (Chemexcil) amounted to Rs. 783 crores during 1987-88. The council has projected an export turnover of Rs. 5,000 crores by the turn of the century if the Government agrees to the proposal to supply ten per cent of the production of public sector units to advance licence holders at global prices.

This will help Indian exporters who are now facing a cartel of European chemical manufacturers, according to Chemexcil Chairman, M. Ramu Deora. European and American manufacturers, realising how Indian exporters have eaten into their markets, have jointly jacked up prices of raw materials and reduced prices of finished pro-

ducts. In view of this, it is imperative that Indian refineries supply naphtha derivatives to exporters of chemicals, drugs, dyes and agro-chemicals at global prices, he said.

The Government had accepted the proposal in principle. However, at various inter-ministerial meetings, the question of who will bear the loss incurred by State units in supplying raw materials at cheaper prices cropped up, delaying decision-making, Mr. Deora said.

He suggested that the loss in supplying ten per cent to the export community be recovered from the 90 per cent of the local sales. Another way out is for the Government to compensate the exporters by way of CCS. Apart from boosting exports to Rs. 5,000 crores, it will in-

crease the value added in current 65 per cent to 80 per cent, he said.

He repeated his plea that deemed exports of intermediate products to advance licence holders should be counted for recognition as export house and that they be given full CCS and income-tax benefits.

Exports during 1987-88 were 39.37 per cent higher compared to the previous year's figure of Rs. 562 crores. Items which registered substantial increase during the year include bulk drugs, dyes and dye-intermediates, inorganic chemicals and psyllium husk. Exports of dyes and dye intermediates increased from Rs. 45.96 crores in 1985-86 to Rs. 213.98 crores in 1987-88, showing a 365.5 per cent increase. The increase is attributable both to increase in quantity and unit value realisation.

Export of bulk drugs have contributed to more than 17 per cent of the total exports of the council, netting Rs. 139.71 crores last year registering an increase of 318 per cent over 1985-86 figures and 60.2 per cent over last year's figures.

Export of formulations declined from Rs. 106.59 crores in 1985-86 to Rs. 102.11 crores in 1986-87 and to Rs. 88.24 crores in 1987-88. This is attributed mainly to financial problems in West Asian and African countries. The council hopes to reverse the trend and has fixed a target of Rs. 100 crores for the current year. Another sector which fared badly is castor oil, because of drought.

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## DRUG TRADE MARGINS

**Centre plans to set up tripartite panel**

The Union Government is planning to set up a tripartite committee, which will examine all problems arising out of fixation of trade margins in the drug industry. The committee is expected to end the present stalemate continuing for the last several months over the issue.

The proposed committee, which will have members from the drug industry, trade and the Government, will create a permanent mechanism for settling all problems of trade margin fixation for the existing drugs, newly introduced drugs and drugs which are outside the purview of price control.

The Department of Chemicals and Petrochemicals has decided to convene a meeting of representatives of the industry and trade in the next week. The objective would do to elicit the views of the industry and trade representatives on the proposal for creating such a permanent mechanism under the auspices of the Government.

The Department has been encouraged to consider setting up such a body following several representations from the industry, in particular, to resolve the crisis that has been brewing in the drug industry over the trade margin issue ever since the margins were fixed as per the new Drug Price Control Order (DPCO) 1987. Even revision of the trade margins in March 1988 did not resolve the crisis.

The industry representatives have informally conveyed their acceptance of the proposal to the Department. The trade's views have not yet been obtained. The ensuing meeting would help the Department work out modalities for such a tripartite set-up, if the proposal is accepted.

Initially, even the Government was unwilling to intervene in the row over the trade margins in the drug industry. In fact, Dr. Vijay Kelkar committee had recommended that the Government should stay away from the trade margin issue and let the industry and trade settle their problems between themselves.

The new DPCO 1987 had stipulated a trade margin of three per cent for the wholesale trade. For the re-

cent for over-the-counter (OTC) drugs sold without any prescription (unethical) and 17 per cent for drugs sold against prescription (ethical).

The old DPCO of 1979 had stipulated that the trade margin for wholesale trade would be two per cent and the margin for retail trade 10 per cent for OTC drugs and 12 per cent for ethical drugs.

The enhanced trade margins were to be paid from the maximum allowable post-manufacturing expenses (MAPE) which also was raised to 75 per cent for category-I drugs and formulations and 100 per cent for category-II drugs and formulations.

The new margins, however, gave rise to a major controversy, as the trade was not willing to accept the new norms. It was argued that even before the new DPCO was enforced, the industry was paying more than the stipulated two-per cent margin to the wholesale trade. The actual margin paid was about four to five per cent.

As such, the new DPCO 1987 had slashed the margin to three per cent for the wholesale trade. Moreover, the wholesale trade and industry was not willing to give the enhanced margin to the retail trade. The retail trade, on the other hand, was not willing to concede any cut in its enhanced margin.

In view of this controversy, the industry was delaying submission of applications for price revision as per the new DPCO. Initially, the Government remained a mute spectator to the row and kept out of it allowing the industry and trade sort it out on their own. The Government even revised prices of about 46 formulations unilaterally under the DPCO provisions.

Subsequently, however, the Government intervened in view of the inordinate delay in resolving the crisis. It asked the Kelkar panel to suggest a way out. The committee recommended a uniform retail trade margin of 15.5 per cent. It also suggested that the wholesale trade margin be decided through mutual discussion between the industry and trade. But the total trade margin

should be within the overall ceiling of 20 per cent, it felt.

It was also agreed that the retail trade could charge Re. 1 extra on each prescription handled during night and 50 paise during day. This would be charged from the medicine buyers and would be outside MAPE.

However, the Government backtracked on this issue and scrapped the additional handling charges on each prescription and instead raised the retail trade margin from 15.5 per cent to 16 per cent.

But even this arrangement was not acceptable to the retail trade. The All-India Chemists and Druggists Association downed shutters of all chemist shops in the country for a day last month. Drugs manufactured by Glindia are being boycotted by retail trade in West Bengal and in some other districts.

The retail trade has demanded that its margin should be calculated on drug prices inclusive of excise duty. The government is not ready to accept this demand. There is thus every possibility of the chemists agitation spreading to other States, creating problems for the industry and the people.

It is in this background that the Government has once again decided to intervene in this controversy and convened the meeting to consider creation of a tripartite mechanism to resolve these problems under its supervision.

— Financial Express, dated June 22, 1988

**MANDATORY COST AUDIT FOR DRUG FORMULATIONS**

The Union government, through a notification on June 6, has brought drug formulations under mandatory cost audit.

Bulk drugs are already covered under compulsory cost audit (under Sec. 223 B) of the Companies Act. The Institute of Cost and Works Accountants of India (ICWAI) has recommended to the government inclusion of several industries including steel rolling, resins, basic chemicals, industrial gases and fertilisers under this provision.

Disclosing this at Bhubaneswar during a chat with newsmen on June 29th, senior members of ICWAI said the institute had already submitted draft cost audit record rules for the mining industry.



## Bengal's drug units facing collapse

The absence of a bulk drug industry plus an inadequate working capital and a shrinking market have combined to push West Bengal's small drug manufacturing units to the brink of "collapse," says Dr. S.K. Sen, president of the state's small-scale drug manufacturers and traders association.

Nearly 98 per cent of the 1,058 drug units in West Bengal are in the small-scale sector which provides employment, directly and indirectly, to nearly two lakh people.

Dr. Sen urged the West Bengal government to withdraw the existing quota system of buying drugs which "hardly gives any meaningful business" to the state's small drug producing units and traders.

Dr. Sen said small manufacturers in West Bengal were finding it "very difficult" to secure working capital whose "only source" now is the nationalised banks. "Whereas in other states, the producers get help from private financiers also," he added.

Dr. Sen suggested that West Bengal government "should think of providing special funds" to help the small drug units get working capital.

The absence of a bulk drug-producing industry in West Bengal, he said, was forcing the state's small manufacturers and traders to face an "unequal competition".

"Traders in West Bengal buy bulk drug from local dealers at 25 to 30 per cent higher prices compared to their counterparts in Gujarat, Bombay, Tamil Nadu and Andhra Pradesh," Dr. Sen said.

He said the markets in the eastern India were "now flooded" with drugs produced in other states whose manufacturers were selling them on credit and with "fantastic commissions running as high as 70 per cent." "With their cost of production and buying, West Bengal producers and traders cannot offer that much commission and are obviously losing out in competition," Dr. Sen pointed out.

Criticising the West Bengal government's "quota system" or purchasing drugs, Dr. Sen said the allocation of government business among 600 or so tenders would mean "very negligible to the manu-

facturers." "He said taking advantage of the state government's quota of 50 per cent purchase from state-owned companies, such companies in states like Orissa, Karnataka and Tamil Nadu are getting business where as drug units in West Bengal get hardly any business from other states."

"The quota system has been introduced with a view to curbing the growth of small-scale drug units in West Bengal Dr. Sen observed.

He said the seven to eight state-owned companies in West Bengal cannot possibly meet the entire requirements of the state government which, then, purchases the drugs from state-owned or managed companies of other states. "Since there is no competition in the government

group, drugs are purchased at very high prices. If this could be avoided, the money saved thereby could fetch more quantity of essential medicines," Dr. Sen said.

Dr. Sen refuted the contention that drugs produced by small manufacturers in the state's private sector were sub-standard. "The central and state government's monitoring agencies at Calcutta are very strict and there is just no question of substandard drugs in West Bengal," he added.

Central drug laboratory sources at Calcutta said that in the cases of complaints about sub-standard drugs in West Bengal it was found out that the manufacturers either did not have the proper scientific knowhow to prepare a particular drug or lacked the fund to buy adequate quantity of raw materials.

### TO BAIL OUT IDPL, HAL

## Government may convert part of loans into equity

The Government is considering to convert a part of its loan to the State-owned Indian Drugs and Pharmaceuticals Ltd. (IDPL) and Hindustan Antibiotics Ltd. (HAL) into equity to help the companies tide over their financial problems.

Giving details of the performance of these companies during 1987-88, the Secretary, Department of Chemicals and Petrochemicals, Mr. H.K. Khan, said that a decision in the matter will be taken soon.

During the first year of the operation of the "rehabilitation plan", in 1987-88, IDPL reduced its cash losses to Rs. 7.48 crores as against Rs. 31.51 crores in the previous year, Mr. Khan said. It also recorded its highest-ever production of Rs. 157.95 crores as against Rs. 79.37 crores, representing a growth of 99 per cent.

Mr. Khan said the company is also planning to increase the capacity for potassium penicillin from 230 mmu to 400 mmu during the current year by putting up an additional compressor and technology upgradation.

The company has also achieved its highest-ever sales of Rs. 136.90 crores in 1987-88 as against Rs. 91.92

crores, representing a growth of 49 per cent. As a result, the standing in the trade market progressively improved from the 39th rank to 16th during the year, he said.

The plan for 1988-89 calls for further stepping up of production and eliminating cash losses, introduction of new products and improvements of efficiencies by technology upgradation. The production during the year is expected to touch Rs. 200 crores, he said.

As regards HAL, Mr. Khan said the company achieved a production of Rs. 72.60 crores in 1987-88 as against Rs. 53.94 crores in the previous year, representing a growth of 35 per cent.

The company has made a cash profit of Rs. 4.33 crores (previous year Rs. 1.94 crores). The company has turned the corner by making a net profit of about Rs. 1 crore, he said.

He said that a separate plant of 1000 mmu from grassroot level is also proposed to be set up in a modular fashion at a cost of Rs. 100 crores. Starting with an investment of Rs. 27 crores with the capacity of 250 mmu, HAL will use its own technology and expertise.



# Drugs distribution policy details—text

The following is the text of the distribution policy for canalised drugs to be followed during the period July 1988 to June 1991.

## 2 (A) DGTD units:

(I) With a view to encourage higher domestic production, each DGTD unit shall be entitled to receive canalised drug materials on the basis of formulation-wise capacities as indicated in its licence plus an item-wise annual growth of 25 per cent.

(II) In cases where no specific formulation-wise capacity is indicated in the licence, the entitlement will equal the unit's entitlement of the preceding year. The item-wise growth of 25 per cent will be allowed when the licensed capacity is fixed or re-fixed and endorsed on the licence. The calculations of entitlement in any year will depend upon the licensed capacity at that point of time plus 25 per cent thereof, and the licensed capacity if at all changes, it can change on the basis of re-endorsement/recognition of capacity, modernisation and automatic growth. Unless the licence is re-endorsed for the enhanced capacity, the original licensed capacity should be taken into consideration for working out entitlement. The calculation of entitlement would be based upon the capacities as indicated in the industrial licence and also drug manufacturing licence. It would also be necessary to check whether drug manufacturing licence is available with the party in relation to which canalised items is being demanded.

(III) Where any DGTD unit in the Indian sector requires canalised raw materials in excess of its entitlement, as worked out on the basis of (I) and (II) above, it may be issued canalised raw materials as requested, provided it produces utilisation certificates to prove the consumption of previously issued materials. At the end of the year, the unit will have to provide a utilisation certificate with respect to this additional and ad-hoc allotment. In case, any part of it has been left unutilised, it will be adjusted against the next year's entitlement of the unit.

In order to enable the STC to take advance action to plan imports, the

DGTD units should be requested to keep the STC informed of the progress of consumption of canalised raw materials at least one month in advance of each quarter.

## 3 (B) Small-scale units:

In line with para 6(5) of the Import and Export Policy, 1988-91 an industrial unit whose capital investment in plant and machinery does not exceed Rs. 35 lakhs shall be treated as a small-scale unit. The small-scale units may be asked to introduce a certificate from a practising chartered accountant/cost accountant regarding the total value of their plant and machinery.

(I) A small-scale unit shall be entitled to get during 1988-89 canalised raw materials to the extent of the item-wise entitlement for the year 1986-87 plus a growth factor of 50 per cent subject to a minimum of Rs. 5 lakhs, in value. Similarly, it shall be entitled to get such material during the subsequent years on the basis of the item-wise entitlement for the previous year plus a growth factor of 50 per cent.

(II) A small-scale unit would have the freedom to ask for any new item or items other than received by such a unit in the previous Year. For this purpose a small-scale unit shall be required to surrender its entitlement of any or each of the items in respect of which it had entitlement during the previous year up to 15 per cent per item, within the value of the surrendered items such a unit can be allowed additional entitlement in respect of any one or more new items.

## 4 (C) New small-scale units:

(I) A new small-scale unit shall be entitled to get canalised items not exceeding the total value of Rs. 7.5 lakhs.

(II) In the case of small-scale units set up in specified industrially backward areas or by graduates/diploma holders in professional subjects or by ex-servicemen/persons belonging to scheduled castes/scheduled tribes, the maximum value of entitlement shall be Rs. ten lakhs.

## 5 (D) Loan licensee unit:

Loan licensee units which do not have their own manufacturing capacity shall be entitled to get canalised raw materials for a value not

exceeding Rs. 1 lakh during the first year of their existence. Such units which have operated for one year shall be entitled to get canalised raw materials for a value not exceeding Rs. 2 lakhs and those which have operated for two years shall be entitled to get canalised raw material for a value not exceeding Rs. 3 lakhs. This facility has to be phased out by the end of the seventh plan, as per the new measures on drug policy announced by the government in December, 1986. The facility of entitlement in the 4th and 5th year may be permitted without any further enhancement in the entitlement.

## 6 (B) Policy for newly canalised items: DGTD units:

(I) In respect of newly canalised items (i.e. items which were not canalised during the previous year), the entitlement shall be on the basis of formulation-wise capacities as indicated in licence(s) plus an item-wise growth of 25 per cent.

(II) In cases where no specific capacity of a particular formulation or formulations is mentioned in the licence, the entitlement of the DGTD units in the Indian sector shall be equal to the highest consumption during any one of the previous five years. In both cases once the capacity is fixed or re-fixed, the entitlement will be equal to such capacity plus an item-wise growth of 25 per cent. In the case of DGTD units in the FERA sector (foreign companies), the entitlement shall be equal to the highest consumption during any one of the previous five years. In both cases once the capacity is fixed or re-fixed, the entitlement will be equal to such capacity plus an item-wise growth of 25 per cent.

(III) Where any DGTD unit in the Indian sector is likely to require more of these newly canalised items than its entitlement calculated on the basis mentioned in (I) and (II) above, it can approach the canalising agency and secure additional allocation on the basis of utilisation certificate to prove actual consumption.

(IV) Whenever a claim is made on the basis of consumption, the concerned units shall supply a consumption certificate furnished by a practising chartered/cost accountant.

## Small-scale units

(I) The entitlement of these units



shall be equal to the highest annual consumption in respect of each of the newly canalised items in any one of the previous five years, plus an item-wise annual growth rate of 50 per cent.

(II) The consumption figures furnished to the canalising agency shall be certified by a practising chartered/cost accountant.

**7 (F) Entitlements of canalised items: for non-drug use**

The entitlement of canalised items required for production of non-drug items by both DGTD and small-scale sector units shall be on the basis of the highest annual consumption of the relevant canalised item during any one of the previous five years. For this purpose the units shall be required to furnish to the canalising agency their actual consumption figures duly certified by a practising chartered/cost accountant. The non-pharma units (both SSI-and large) using drug items in their manufacturing activity shall be treated at par with pharma units with regard to the entitlement of the canalised items and the growth rate in this case will be 100 per cent.

**8 (G) Treatment of period of 'no registration' for fixing entitlement**

The entitlement of an actual user,

who approaches STC for registration of canalised items after a gap of more than 2 years, would be fixed treating the unit as a new unit. Where the period of 'no registration' does not exceed 2 years, the entitlement will be pegged at the level which existed in the year in which the company last procured the canalised item(s) from the canalising agency.

**9 (H) Additional release for meeting govt. orders etc.**

When any DGTD unit in the Indian sector or a small-scale unit requires canalised raw materials in excess of its entitlement for executing supply orders from institutions/hospitals/dispensaries of the Central/state governments and public sector units and municipal corporations, municipal committees and such other bodies under the local self government, it may be given additional release of canalised raw materials on production of documentary evidence towards contractual commitments for such supplies.

Such units would be required to produce a utilisation certificate towards consumption of the previously issued material from a chartered accountant. Releases of such additional quantities for discharging the

contractual obligations will not be taken into account for computing the future entitlement of the concerned actual user.

**10 (I) Cancellation of registered demand**

Requests from actual users for cancellation of their registered demand with the canalising agency for one or more items, on account of revision of price of drug(s) by the government would be considered by the canalising agency on a case-to-case basis, on merits. The canalising agency will examine such requests keeping in view the contracted commitments for import of the raw material already entered into by it or the allocation orders already issued on the indigenous manufacturers. If the canalising agency on examination of such cases agrees to cancel the demands, the earnest money deposited by the actual user for such registration, will not be forfeited.

Notwithstanding the above policy, the ministry may, from time to time, give such instructions regarding the entitlement of any actual user or in respect of any canalised drug item, as are warranted in public interest. (Please refer Chemical Weekly issue dated 5.7.88, p. 46 for news of the same).

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## Molasses export from Aug.

After a gap of nearly five years, India is all set to resume export of molasses thanks to the policy decision taken by the Union Government in response to persistent appeals from the sugar mills.

To begin with, about five lakh tonnes are expected to find market in Europe fetching foreign exchange at the rate of \$50 f.o.b. price per tonne. The first shipment will start in August.

The exports will be handled by the Indian Sugar and General Industry Export and Import Corporation (ISIEC), an agency promoted by the Indian Sugar Mills Association (ISMA) and the National Federation of Cooperative Sugar Factories (NFC-SF).

Of the five lakh tonnes of surplus molasses, three lakh tonnes will come from Uttar Pradesh and one lakh tonnes each from Maharashtra and Tamil Nadu. The latter two states have been told to export 50 per cent of their quota to other deficit States, but the Government is being approached to divert this portion also to the export market in view of the expected lower offtake by the distilleries.

Hailing the Government's pragmatic approach to the industry's problem arising out of the accumulation of stocks, Mr. Rm. V. Tyagarajan, President of ISMA, hoped the export will be on a continuous basis.

Talking to 'Financial Express' at Madras, he said till April-end this year 37 lakh tonnes of molasses were piled up with the mills posing a serious marketing problem. On an estimated annual surplus of 10 lakh tonnes, the industry has pleaded with the Government to allow export of 10 lakh tonnes to earn Rs. 70 crores.

Mr. Tyagarajan has stressed that the Government should find a lasting solution to the issue by announcing a long-term export policy so that arrangements can be made with foreign buyers for exporting on a regular basis.

This is because the country is sure to sustain its record sugar production this year as well with an estimated 92 lakh tonnes against 85 lakh tonnes last year. More expansions and new units are also on the anvil.

Compared to this, offtake of molasses by the distilleries is not pick-

ing up. During 1986-87, against their requirement of 43 lakh tonnes, they lifted only 32 lakh tonnes. This ultimately posed a serious storage problem to the factories, the ISMA President said.

He endorsed the Government's argument that it is better to export value-added product like alcohol rather than molasses. But owing to the high cost, not a single drop could find market although the Government has allowed export of one lakh litres, he said.

Mr. Tyagarajan said that this is the first time, ISMA and NFCSF

have been nominated by the Government to handle molasses export through ISIEC. Earlier in 1984, the State Trading Corporation (STC) was entrusted with the task.

He expected a good demand for molasses in the European markets to meet the needs of cattlefeed-making units. The shipment has been arranged to reach the markets in September, which is the peak season.

In his view, it will be uneconomical to enter distant markets like Japan and the US. Moreover, they have been depending long on supplies from Taiwan and Latin American countries.

## Rs. 186.67 crores shortfall in THWP output

Even after eight years of being commissioned the Tuticorin Heavy Water Plant (THWP) has achieved an average annual production of only 20.6 per cent resulting in a shortfall in production of Rs. 186.67 crores.

The low production levels pushed up the cost of heavy water from Rs. 4,120 a kg. to Rs. 13,800 a kg.

Increased capital deployment and increased consumption of utilities and spares also added to the high cost of heavy water production, the Controller and Auditor General of India (CAG) said in its latest report.

The CAG criticised the decision to contemporaneously set up two heavy water plants at Baroda and Tuticorin based on a new French technology. Even the French pilot plant had been in operation for only two years.

A technical collaboration agreement was entered into with Gelpra, a French consortium, in 1971 for a turn-key project, THWP, to be commissioned by January 1975. But the plant was commissioned in 1978 more than 42 months behind schedule. However, Gelpra was absolved of all their contractual obligations, guarantees and warranties through an amending agreement in 1978 because the plant could not be run and tested on sustained basis due to power shut-down.

The THWAP did not reach the level of production indicated in the technical agreement and even the consumption of utilities and spares was higher than anticipated. Thus, the technology transfer was incomplete at the time of the termination of the contract and the foreign col-

laborator had to be absolved of his contractual obligations, the CAG said.

The Department of Atomic Energy (DAE) attributed the 42-month delay in commissioning of the plant to the delay in acquisition of land, completion of structural work, supply of equipment and increased import.

The initial financial sanction for the THWP was Rs. 20.27 crores, but it went up to Rs. 48.93 crores on completion.

The Baroda heavy water plant, also set up with Gelpra collaboration, faced problems right from the beginning the report pointed out. There were also delays in the supply of fabricated equipment, design defects, leakages failure of pumps, explosion and cracking of equipment.

The problems encountered were typical of a new technology, the CAG said. The Baroda plant was taken up in 1970, it became operational only in 1980.

The THWP operated only for, 1,284 days during the last eight and a-half-years as against 2,550 available days.

The plant, commissioned in July, 1978, has not been declared commercial so far and no proforma accounts have been prepared, the CAG pointed out.

Regarding the deployment of personnel, the CAG recalled that only 35 people, exclusive of maintenance staff, were required to run the plant according to the original agreement with Gelpra. However, the DAE assessed the requirement to be 350 people.



## HZL project approved

The government has given the green signal to phase one of the Hindustan Zinc Limited (HZL) integrated project for developing large and rich deposits of Rampura-Agucha mine and installation of a zinc-lead smelter at Chandariya in Rajasthan.

The former project will have an estimated 8,000 tpa and the latter 70,000 tpa zinc and 35,000 tpa lead. The Rampura-Agucha mine has about 60 million tonnes of ore reserves with (plus or minus) 15 per cent zinc and lead.

A note prepared by the steel and mines ministry states that phase one of the above projects will comprise engineering, environmental impact assessment and management plans, pilot pit excavation and other enabling works in metallurgical testing of ore. It will be at a cost of Rs. 8.5 crores, with a foreign exchange component of Rs. 14.7 crores. The UK government had already accorded grant-in-aid totalling around Rs. 160 crores to the integrated project.

The HZL, the implementing agency, has already prepared firm cost estimates and submitted to the government for final investment decision.

The HZL hopes to get investment decision from the government by August 1988 and if all goes well the project is expected to be commissioned by January 1991, says the official note.

The proposed project is part of HZL and has ambitious plans to take the country towards the goal of attaining self-reliance in zinc and lead.

When the lead-zinc smelter goes on stream, the country's demand satisfaction from indigenous production would rise to 90 per cent for zinc and 80 per cent for lead by the mid-1990s on full build up production.

These two metals are extensively used by various industries and the country's lead-zinc deposits are mainly concentrated in the precambrian rocks of Rajasthan. About 98 per cent of the country's total deposits of 352 million tonnes are located in Zawar, Rajpura-Dariba, Rampura-Agucha, Barnia Kalan and so on. When HZL was floated two

decades ago, its operations were limited to only two units — 500-tonnes-per-day at Zawar in Rajasthan and 3,600-tonnes-per-annum lead smelter in Bihar. The present annual mining and smelting capacities of HZL are mining (lead-zinc ore) 23,22,000 tonnes, zinc metals 79,000 tonnes and lead metal 30,000 tonnes.

Secondary producers of lead and zinc are however in the private sector with a total licensed capacity of 45,500 tonnes shared by four companies in the organised sector.

Despite heavy production capacities, the percentage of demand satisfaction for zinc has been increasing slowly. For instance, as against a demand of 125,000 tonnes in 1984-85 for zinc, the percentage satisfaction was 46 which, at present reckoning, will go up to 49 per cent in 1988-89 against a demand of 46,000 tonnes. (But in 1985-86 and 1986-87 the satisfaction rate was much better at 56 and 57 per cent according to the paper). In the case of lead, as against the demand of 61,000 tonnes in 1984-85, the percentage of satisfaction was 36 which in 1987-88 was 41 per cent with a demand of 79,000 tonnes. The projected demand for both the metals in 1999-2000 A.D. are 226,000 tonnes and 144,000 tonnes respectively against which the percentage satisfaction is likely to be 75 and 62 subject to the commissioning of new capacities stated earlier.

The indigenous production of zinc had risen from 57,674 tonnes in 1981-82 to 60,557 tonnes in 1987-88 and lead from 25,837 tonnes to 32,290 tonnes. The gap between the demand and supply was bridged by imports through canalising agencies as well as against Rep and advance licences.

The note has warned that "since power situation was unlikely to improve in the foreseeable future in Rajasthan and Andhra Pradesh", production was likely to be affected. To partly offset the damage, the HZL has already shifted one 3.5 mw dg set from Rajpura-Dariba mines to Vizag zinc smelter. Another dg set of 3.5 mw capacity will be added to Vizag. The company has also ordered for import of one 5 mw dg

set from Japan for its Debari zinc smelter. It will also order further sets to augment power supply, the note concludes.

### COPPER, ZINC PRICES UP

Prices of copper, zinc and tin, sold by the Minerals and Metals Trading Corporation (MMTC), have been raised by margins ranging between Rs. 1,000 and Rs. 5,000 per tonne with effect from July 1.

Prices of other metals like pig lead and nickel have remained unchanged. The new prices will remain effective till further notice.

The prices were revised by the inter-Ministerial committee of the Government in view of the rise in international prices and appreciation of the dollar vis-a-vis the Indian rupee.

The new prices with old ones in brackets are: Rs. 75,000 (74,000) per tonne of electrolytic copper wire bars/high grade cathodes Rs. 81,000 (80,000) per tonne of continuous cast copper wire rods, Rs. 46,000 (41,000) per tonne of electrolytic high grade zinc, Rs. 46,200 (41,200) per tonne of special high grade zinc, Rs. 23,000 (23,000) per tonne of pig lead 99.97 per cent, Rs. 23,200 (23,200) per tonne of pig lead 99.999 per cent, Rs. 210,000 (205,000) per tonne of tin, Rs. 425,000 (425,000) per tonne of nickel briquettes and nickel squares, Rs. 427,000 (427,000) per tonne of nickel pellets/f. shots/strips.

### SAIL SETS UP NEW ENVIRONMENT DIVISION

The Steel Authority of India Ltd. has created an integrated environment management division to give a boost to environment management and pollution control activities.

The division, to be located in Calcutta, will be responsible for developing a data bank and expertise for pollution control. It would also undertake an environmental study financed by the World Bank.

According to an official press note, the existing environmental organisation in the research and development centre for iron and steel at Ranchi is being suitably relocated and merged with the central division at Calcutta.



## Scientists told to develop polysilicon

The Electronic Commission Chairman, Mr. P.S. Deodhar, has said that the scientific community should have "grabbed" the opportunity to use the data acquired at a huge cost from the Hemlock semiconductor of the United States for upgrading the process of making device grade silicon in the country.

Talking to UNI at Bangalore he said the country had paid \$4.89 million for the Hemlock process package, basic engineering design, engineering details on critical development and standard operating procedures. Besides, the Government had spent Rs. 2.11 crores on related works within the country.

He said not many countries had more than one process to produce polysilicon and the country should utilise the vast data it had got from the Hemlock Company and improve upon it for making polysilicon of high purity.

The contract with the US company was abrogated after a two-year controversy over favouring foreign technology, while it was available within the country.

Mr. Deodhar said scientists at the private sector Metkem Silicon in Mettur, Tamil Nadu, the country's only silicon producer, had not been successful in developing electronic device grade silicon. Their entire production was routed through the Department of Non-Conventional Energy Sources (DNES) for making photovoltaic panels. Though the requirement for device grade silicon was not big, it was growing, he added.

He favoured utilisation of the infrastructure at the National Silicon Facility for setting up a pilot plant with the upgraded Hemlock process.

This would enable the Metkem Silicon R and D unit to improve the quality and bring down the cost to international level, besides taking up device grade material.

Besides the Metkem technology, developed by the Indian Institute of Science at Bangalore, another process to make polysilicon has been developed by a team of scientists at the National Chemical Laboratory (NCL), Pune. The process adopted fluidised

bed with trichlorosilane as feedstock and was said to be far superior compared to other process already commercialised.

However, the team had not been successful in starting a commercial plant due to inordinate delay by the Department of Electronics in considering a proposal to import a second hand plant for 100 per cent

export-oriented unit. In the meantime, China bagged the plant and the project was subsequently rejected by the Department, according to NCL sources. The sources said a fresh application was now, before the Department for a smaller unit and an industrialist in Pune was willing to take up the project.

Meanwhile, the NCL team had successfully scaled up production from one tonne to four tonnes with the material superior in quality.

## In search of polymers

India's desperate search for polymers around the world should not come as a surprise. The committee on perspective planning of petrochemical industry (1986-2000) has estimated that demands for various types of polymer would go up from 750,000 tonnes in 1989-90 to 1,713,000 tonnes by 1994-95 and to 2,516,000 tonnes by 2000 A.D. The indigenous availability of polymers will be roughly half the demand and the country would be net importer. There are over 10,000 plastic processing units all over the country. The government has taken promotional measures for the use of plastics in such sectors as agriculture, irrigation and water management, food storage and industry. Plastics have acquired such a hi-tech profile as to find application in automobiles, electronics and communications systems. Even the world demand projections have gone awry. As against the projected demand growth of one to three per cent per annum in Europe alone, the actual demand growth was nine to 11 per cent in the first four months of the current calendar year. In USA, demand has gone up on an average by eight to 10 per cent a year. In China too demand is growing fast.

The rate of growth in demand for plastics in India has been phenomenal — around 15 per cent a year. A forecast is that the demand will keep up its pace in the years to come. Thus the need for import of plastics or plastics raw materials will continue. It is in this context that the government

sent out a delegation to Western Europe, USA, UK and Brazil to scout for polymer supplies. It could persuade the main producers to earmark for the Indian market 57,500 tonnes of polymers and that too during the last quarter of 1988 and 258,000 tonnes during 1989. The supply position is so tight that the producers are in a position to dictate terms. For instance, they would like prices to be fixed from time to time on a bilateral basis and insist that purchasers should not insist on open tendering procedure.

The fast growth of demand for polymers and the tight world supply suggest that we should not dilly-dally with the plans for the expansion of domestic output but push ahead with such projects with vigour. Care must, of course, be taken to avoid getting into outmoded technology and inefficient methods or scales of production. Competitive efficiency should remain the acid test.

— Economic Times

### EXPORT ORDER FOR INDIA POLYFIBRES

India Polyfibres has bagged an export order of 4,000 tonnes of polyester staple fibre from European countries. Disclosing this Mr. Sanjiv Goenka, director of the company said that judging by the response it received from the trial use of the company's products by overseas clients, India Polyfibres could hopefully look for a better export prospect.



## Uptrend in dyestuff export

The dyestuff and dyestuff intermediates, manufactured by Indian companies, have begun to find their way to sophisticated markets of the US, Europe and Japan and scope for exports in years to come is fast expanding, according to Mr. Rajesh J. Sarvaiya, Managing Director, Serene Dyestuff Industries Ltd.

He said although as early as 1974-75, the target for exports of dyestuffs and intermediates was put at Rs. 100 crores, the country was able to export this only about two years ago. Several factors, mostly negative, contributed to the export culture in the industry.

Firstly, the industry was operating much below the capacity; its domestic base was almost crippled by heavy excise duty; the organised sector was further weakened by the proliferation of excise-exempted units and finally continuing recession in the textile industry, major consumer of dyestuff, virtually forced the units in the organised sector to export.

However, the international scene in dyestuffs, due to high cost of production and stringent pollution control, was slowly changing. The developed nations were looking towards countries like India for their dyestuffs requirements. The unprecedented appreciation of hard currencies particularly Yen, DM, \$, SF, etc. against the rupee also contributed to make Indian exports competitive.

Mr. Sarvaiya also pointed out that besides scope of rising exports, (the exports in 1986-87 had gone up to Rs. 98 crores against the target of Rs. 62 crores and during April 1987 to November 1987, the export figure touched Rs. 87 crores compared to Rs. 33 crores in the corresponding period of the previous year), the share of polyester fabrics in the total textile production was increasing necessitating import of disperse dyes.

Serene Dyestuff Industries Ltd., which was entering the capital market with an issue 13,00,000 equity shares of Rs. 10 each for each at par, planned to manufacture 5,000 tonnes per annum of disperse dyes and 1,000 tonnes per annum of non-ionic surface active agents (ethylene oxide condensates) catering to the high-growth segment of the polyester industry.

Serene's plant was also capable of manufacturing most of the intermediates for captive consumption leading to lower operational cost.

The non-ionic surface active agents (ethylene oxide condensates) manufactured by the company were primarily used as emulsifiers in varied industries. Mr. Sarvaiya added his company was in the dyestuff processing and trading business for nearly three decades and its experience would stand it in good stead. It had established marketing network throughout the country. It would be represented by stockists, agents and

distributors located in every major consuming centre.

The project was located at MIDC industrial areas in Lote-Parshuram, near Chiplun in Ratnagiri district of Maharashtra. The site was about 240 km from Bombay and situated on the Bombay-Goa highway. The area, being backward one, was eligible for capital subsidy, sales tax incentives and income-tax concessions. There would be no gestation period since the plant was ready for commercial production.

### TRADE SAMPLES EXPORT NORMS REVISED

The Government has formulated the revised procedure for export of trade samples for various items. The necessity for obtaining sample export cards from councils has been dispensed with.

Value limits for export of samples of various kinds are:

Samples of wooden furniture not exceeding Rs. 10,000 per consignment;

Text books and other books not exceeding Rs. 3,000 per consignment;

Drug formulation with main consignment up to 10 per cent of FOB, when sent independently not exceeding Rs. 25,000 per consignment;

Agro-chemicals not exceeding Rs. 50,000 per consignment.

Canalised items by canalised agency only without any value limitation;

Decontrolled items without any value limitations.

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# **ECIL pollution control measures 'not enough'**

Water, air and noise pollution caused by the Travancore Electrochemical Industries Limited (TECIL) at nearby Chingavanam had reached intollerable levels, according to people in the locality.

Representatives of the local people said at a news conference that the factory authorities were not taking adequate steps to minimise the threat to the health of the people.

Effluents from the calcium carbide plant were polluting the nearby canal and water sources, as also the air. Poisonous liquids percolating from slurry yard were polluting the nearby wells. Add to all this vibrations caused by the 1400 HP motors of the new desulfurisation compound plant under construction was causing tremors in surrounding areas they said. Also the horrifying sound of the mills grinder was unbearable they said.

They appealed to the state government not to grant permission to the factory to run the new mill, until necessary remedial steps had been taken, the management of TECIL when contradicted the assertions of the local people.

Mr. Gopalakrishnan, general manager of the company said the company had done all possible to minimise the threat to the health of the people around.

He denied that the slurry yard would cause any pollution. The yard was concrete-lined and no poisonous substance could percolate to the nearby wells. Moreover, the slurry consisted of only calcium carbonate and water, and these were not poisonous.

In addition, the water from this slurry was re-circulated for factory use and no amount of it was let out.

As regards the smoke emanating from the furnaces of the calcium carbide unit, Mr. Gopalakrishnan said they had "modernised" one of the furnances at a cost of Rs. 2.5 crores. If this was found satisfactory, the other furance would also be modernised. That would minimise the presence of poisonous wastes in the smoke to permissible limits he maintained.

Asked about the new plant for producing de-sulphurisation compound which was used for reducing

the sulphur content by iron and steel factories, Mr. Gopalakrishnan said the mill had not even taken the trial run. Only the motor was run with the mill empty, and the people were raising unnecessary hue and cry about its vibration. He said that if the motor was run with the mill fed with carbide, the noise would not be more than the noise produced by the mill of the Travancore Cements. There was no need to panic he maintained.

Mr. Gopalakrishnan said the new factory would not be running three shifts as only 3000 tonnes were on demand in a year. To produce this much, the factory with a daily capacity of 10 tonnes would have to be run for one shift for 300 days in a year. As such the apprehension of round the clock run of the factory by the people was unfounded.

Mr. Gopalakrishnan said the calcium carbide unit with an annual capacity of 45,000 tonnes was now producing only 22,000 tonnes because of lack of demand. Even out of that only 10,000 tonnes were being sold out. Of the balance 4000 to 5000 tonnes were being used for producing acetylene black. With the prospects of lack of demand for calcium carbide, with consumers switching to other practices, the company was itself facing dire straits he said. This portended a bleak future for the company he added.

## **MAZDA PACKAGING MAKES 5-LAYER PLASTIC FILMS**

The Government's recent directive making it compulsory for manufacturers to pack at least 25 per cent of their edible oil production in smaller packages to prevent adulteration has created a great demand-supply gap for plastic films.

The demand at present is 12,000 tonnes per annum and is likely to shoot up further, according to Mr. H.P. Ranina, chairman of Mazda Packaging Ltd. He was speaking at the inauguration of the company's five-layer film producing plant at Uplat in Thane district near Gujarat-Maharashtra border recently.

He said the multi-layer co-extrusion blown film line, imported from Reifenhauer GmbH, West Ger-

many, was capable of processing varied polymers such as ldPE, lldPE, Nylon, Surlyn, Primacor, EVOH, EVA and hdPE. The computerised machinery has a capacity of producing about 200 kgs. per hour of the film.

The entire project cost of Rs. 5.5 crores was less than the estimated Rs. 5.65 crores. In the first year itself, the company hoped to achieve 90 per cent capacity utilisation and 100 per cent in the second year, he said.

The management expects a profit of Rs. 1 crore in the first year and about Rs. 3-3.5 crores in the second year on turnovers of Rs. 7 crores and Rs. 12 crores, respectively. This was possible because orders from just three companies, ITC, Britannia and Glindia, were more than double the plant's capacity, the chairman said.

## **MINERAL OUTPUT UP IN MARCH**

The total value of mineral production (excluding atomic and minor minerals) in the country in March 1988 increased to Rs. 1,024 crores from Rs. 955 crores in February 1988.

The contribution of petroluem (crude) was the highest at Rs. 488 crores (about 48 per cent) followed by coal at Rs. 415 crores, iron ore Rs. 30 crores, limestone and lignite Rs. 19 crores each.

The output of coal during the month was 18.2 million tonnes, petroleum (crude) 2.7 million tonnes, lignite 918,000 tonnes, iron ore 4.8 million tonnes, manganese ore 109,000 tonnes, copper ore 435,000 tonnes, cromite 87,000 tonnes, gold 165 kgs, bauxite 269,000 tonnes, lead concentrates 3,528 tonnes, zinc concentrates 10,703 tonnes, limestone 4.9 million tonnes, patite and phosphorite 58,000 tonnes, dolomite 82,000 tonnes, and magnesite 33,000 tonnes.

The index of mineral production with base 1980-81 100 works out to 213 which shows that mineral production in March 1988 on the whole has increased by six per cent compared to the previous month.



## Dramatic change in molasses scene

The molasses scene in the country appears to have changed dramatically with the commencement of the current sugar season. Sugar production is expected to touch a record level of 92 lakh tonnes in the current season. Consequently, there would be a higher production of 42 lakh tonnes of molasses also.

The government proposal to allow the export of molasses has thus been viewed as a step in the right direction by the sugar mills. Already, sugar mills in both the major sugar-producing states, Uttar Pradesh and Maharashtra, are facing problem of storing molasses.

The sugar industry in the country produced only 36 lakh tonnes of molasses in the last season. The chemical industry and the potable sector could not consume even that much quantity of molasses because of various reasons. Thus, the current sugar season has started with a carryover stock of 2 lakh tonnes of molasses with the sugar mills. With an expected production of 42 lakh tonnes of molasses during the current season, the country will surely have an exportable surplus, industry sources say.

The sources feel that the exportable surplus could be at least 10 lakh tonnes. The government's thinking is to allow the export of 5 lakh tonnes of molasses initially. An export plan is being finalised.

Three factors are stated to be mainly responsible for the govt. decision to allow the export of molasses by the sugar mills.

First, the stocks of molasses are mounting with the sugar mills, adding to their carrying costs. There has been a drop in the offtake of molasses by distilleries, both the UP and Maharashtra during the last several months.

This is because a number of distilleries themselves are carrying huge stocks of industrial alcohol, consequent to a cut-back in consumption by the chemical industry at present.

Three large users of industrial alcohol, namely, Synthetic & Chemicals Ltd, Indian Explosives Ltd, and Union Carbide have virtually stopped lifting alcohol for different reasons. In this context, allowing the export of molasses would be a big

relief to the sugar mills. Many of them are finding it difficult to pay sugarcane arrears to farmers.

Second, the government decision to allow the export of industrial alcohol by the distilleries a few months ago did not click as the international price for alcohol had become unattractive. Distilleries could not make any exports so far.

Third, the movement of molasses and alcohol from the surplus states to deficit states is becoming increasingly difficult in the context of multiplicity of state levies imposed by surplus states. The Central Molasses Board has virtually no control on the distribution of molasses or alcohol in the country.

The sugar industry circles feel that there would be an exportable surplus of 5 to 10 lakh tonnes of molasses every year, if the present trend in sugar production continued. And there is a fairly good demand for molasses in the international market. The price in the international market is almost 7 times higher than the government-fixed price of Rs. 120 a tonne.

The chemical industry circles, however, feel that the government should have a long-term policy with regard to both molasses and industrial alcohol. If adequate encouragement is given to the chemical industry, there would be no need to port these two commodities at all, these sources say.

In fact, a number of alcohol-based chemical units are either closing down or working below 50 per cent of their installed capacity in deficit states like Tamil Nadu, Andhra Pradesh, Karnataka etc, for want of alcohol. For these units buying alcohol from U.P. and Maharashtra becomes highly uneconomic because of various state levies, including export pass fee.

It is also important that the government should encourage chemical industries based on molasses directly. Currently only citric acid is manufactured directly from molasses, while most of the other organic chemicals are based on industrial alcohol.

The Bhattacharya committee on alcohol and alcohol-based chemical industry, in its report submitted to the government some time ago, has suggested that for meeting the growing alcohol requirements both the chemical industries and the potable sector, the entire molasses must be made available to distilleries for conversion into alcohol. The committee has also expressed the view that there should be a ban on the export of this raw material from the country.

For taking care of the temporary surpluses of molasses, the sugar industry should build adequate storage capacities. The committee has also felt that it is essential to maintain the cost effectiveness of alcohol as an industrial feed-stock and it may be affected seriously if an attempt is made to decontrol molasses or to substantially increase its price.

TABLE: PERSPECTIVE PLAN FOR ALCOHOL BASED CHEMICALS

	Estimated Demand 1985-86 (tons)	Requirement of alcohol (KI)	Estimated Demand 1990-91 (tons)	Requirement of alcohol (KI)
2-Ethyl Hexanol	37000	122,100	67000	221,100
Acetic Acid	55000	77,000	80000	112,000
VAM	23000	47,000	34000	69,700
Acetone	38000	98,000	56000	145,600
N-Butanol	11000	20,900	15000	28,500
Ethylene Oxide	16500	36,300	25000	55,000
Ethylene Glycol	63000	111,500	80000	141,600
SBR	56000	184,800	93000	306,900
Styrene	62000	57,000	90000	82,800
Total Alcohol		775,000		1163,200

Source: Report of the Bhattacharya Committee of Technical Experts on Alcohol and Alcohol Based Industries, January 1980.



# PARACETAMOL

IP/BP

## CHEMICAL Formula

Acetaminophen

4' - - Hydroxyacetanilide

P - acetylaminophenol

N - Acetyl p-aminophenol

P - acetaminophenol

P - acetamidophenol

## STRUCTURAL Formula

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NHCOCH<sub>3</sub>

## MANUFACTURAL Formula

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**Regional Representatives**

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# The Biggest Manufacturer of India



# GSTP removal to boost leather garment exports

The country's exports of leather garments to the US is likely to get a shot in the arm with the withdrawal of the provisions of the general system of trade preferences (GSTP) as applicable to South Korea, Taiwan, Hong Kong and Singapore with effect from July 1, 1988.

According to the Council for Leather Exports (CLE), now that preferential treatment to some of India's biggest competitors will have to go, Indian exporters would be better placed to enter the US markets in a bigger way.

Though the Federal Republic of Germany continued to be the largest customer of leather garments, of late, exports to the US has been on the upswing, which the Indian exporters are only too keen to tap.

Exports to the US had gone up by as much as 65 per cent in 1987-88, over that of 1986-87 from Rs. 334.4 lakhs to Rs. 951.2 lakhs.

During the same period, exports to West Germany had climbed by 21 per cent from Rs. 31.56 crores to Rs. 44.55 crores.

The total exports of leather garments from the country registered a phenomenal rise of 70 per cent, from Rs. 62.26 crores in 1986-87 to Rs. 105.72 crores in 1987-88.

However, one low point that was causing concern to the leather industry was the fact that exports of finished leather to France, the UK and the US had stagnated over the past few years. On the other hand, other importers like Spain, Portugal and some South-East Asian countries had increased their off-take from India but posed as a major competitor in the world markets for various value-added leather products.

Regarding footwear components, CLE has pointed out that the Indian industry in the years to come would have to gear itself for meeting the changing preferences in countries like West Germany and the US which were gradually moving away from components and going in for complete shoes.

To achieve an export target of Rs. 1400 crores during 1988-89, CLE has pleaded for several concessions from the Government including duty-free import of finished lea-

ther and reduction of import duty on PU films.

Though there has been a long-standing demand of the industry for allowing imports of all types of finished leather, duty-free under OGL, at present these were allowed

## REP licence valid for import of samples

REP licences issued to export houses and trading houses on their own exports, will also be valid for the import of samples, according to a public notice issued in New Delhi.

As per the notice, after sub-para (2) in chapter-XV, Para 180, the following sub-para will be added:

(3) REP licences issued to export houses/trading houses on their own exports, will also be valid for the import of samples as per the provisions contained in Chapter-XVIII of the Import-Export Policy."

Similarly, the following para has been added after 186 in chapter-XV (import policy for registered exporters) "186-A (1): REP licences issued during the preceding licensing year will also be valid within their overall value, for the import of items permitted in the statement of import policy for registered exporters Appendix-17 of the policy."

This is subject to the value restrictions, if any, applicable thereto, in cases where the REP licence in question, relates to the export products corresponding to the same items in Appendix-17, provided the item to be imported is not already covered by the licence or it is subject to a value limit in the licence which is more restrictive than the limit permissible for import in the import-export policy.

In cases where the export product serial numbers or sub-serial numbers, have undergone a change in this policy the importer would be eligible to import only such items of Column 4, as are permissible against the serial numbers, in which case the exported product is classifiable under this policy.

In the chapter on export houses and trading houses after para 212 (2) A, the following has been added: "however the CIF value of the REP licences which are surrendered to the licensing authorities concerned as unutilised, with a minimum balance validity of three mon-

ths on the date of surrender, will not be deducted from the fob value of export for calculating NFE earnings for that year".

Moreover, CLE holds that in order to upgrade low grade skin and hides, it was essential to import PU films at reduced rate of duty of 35 five per cent. Though the Government had reduced the duty of 105 per cent it was felt that a further reduction was necessary to help the industry.

ths on the date of surrender, will not be deducted from the fob value of export for calculating NFE earnings for that year".

In chapter XIX on duty exemption scheme, Para 225, in line 7, after "export order", the following has been added: "export houses/trading houses will also be eligible to obtain licences under this scheme, without a specific export order".

In the chapter on (diamonds, gem and jewellery) Paras 285 and 286 (I) at the end of sub-para (7) of para 285, the following has been added: "However, for the purposes of regularisation in terms of paragraph 374 of the hand book, surrender will be accepted only in respect of valid REP licences where the Col. 4 items of import are rough diamonds".

(II) at the end of sub-para (8) of para 286, the following has been added: "However, for this purpose, the surrender will be accepted only in respect of valid REP licences where the column four items of import are rough diamonds".

## HEAT-SEALABLE PVDC COATING

A Vapi-based small-scale unit has introduced heat-sealable PVDC coating on plastic films and paper.

PVDC (polyvinylidene dichloride) coating has been perfected for the first time in India by adapting West German equipment, according to Mr. Kirit Thanawalla, Chairman of Anant Packagings.

The company has equipment to undertake a variety of tasks like silicon-coated kraft paper for industrial multilayer sacks, silicon-coated glassine for release in labels, silicon coating on non-woven for medicinal adhesive tapes, heat seal lacquer coat on glassine paper for pharmaceutical tablet packing special "Chromkraft paper", greeting card and book covers.



## CAPITAL GOODS

## Group for cheaper components import

The advisory group on capital goods industry, set up by the Planning Commission, has called for immediate corrective steps to make imports of components cheaper than those of finished equipment.

The group has said that although the concept of three-tier duty structure, where the highest rate of duty is for the import of finished products, somewhat less for components, and the lowest for raw materials, has been accepted, several anomalies in the duty rate for the capital goods sector still persist. Indeed, the 1988-89 Budget has accentuated the problem, the group has said.

The group has said that for many items of food processing and packaging machinery, the import duty was reduced to 35 per cent while the import duty on components for packaging machinery was 120 per cent. For certain types of equipment, like rubber machinery, while the rate of duty has gone down steeply for complete equipment, the rate of duty on components has gone up marginally.

The group headed by Mr. Mantosh Sondhi has said that there is no justification for the wide array in the rate of import duty on diverse types of capital goods. The other members of the group include Mrs. Otima Bordia, Secretary, Industrial Development, V.K. Dar, former Secretary, Department of Public Enterprises, Mr. P.R. Lately, former Secretary, Technical Development, Dr. Vijay Kelkar, Chairman, BICP, Mr. R. Naidu, Chairman and Managing Director, HMT, Mr. Vindo Doshi, Walchandnagar Industries, Mr. S.S. Nadkarni, Chairman and Managing Director, IDBI, Mr. U.V. Rao, I and T, Mr. K.R. Parmeswar, Bureau of Indian Standards, and Mr. Tarun Das, Confederation of Engineering Industry.

The group has said that import duty on equipment for the fertiliser industry should be raised from 15 per cent to say 20 per cent since the existing rate militates against the manufacture of fertiliser equipment within India.

To promote the demand for machinery and to reduce the capital

commended reduction in excise duty on industrial machinery from 15 per cent to five per cent. Similarly, to encourage indigenous design and development effort in the capital goods sector, indigenously designed equipment should bear an excise duty at only two per cent.

The group has said that while the rationale of awarding certain major projects on a turnkey basis is well taken, certain conditions and systems should be built into such contracts whereby the foreign bidders procure all indigenously available equipment. The evaluation formula should be based on the landed cost of equipment and the FOB cost.

In all cases where there is a strong indigenous angle, the import duty on such capital goods should be not less than 85 per cent.

The group has recommended that certain basic inputs like steel, pig iron and aluminium for the capital goods industry should be supplied at concessional prices. For this purpose, a system of dual pricing should be operated, through a reliable agency on the basis of simple workable principles.

The prices at which steel may be made available to Indian equipment manufacturers may be fixed at, say, the international price plus 25 per cent. This has been recommended as import duty on equipment required for projects has been raised to 85 per cent.

The group has said that the measure was taken on recommendations of the BICP, though the latter had recommended a package somewhat different and more favourable to indigenous industry than finally adopted. Thus, the increase in the import duty rate by itself — as per BICP calculations — is not enough and there is need for a total package of duty protection and concessional steel.

The total quantum of steel involved in the capital goods industry is estimated around 1.50 lakh tonnes per annum and the quantity of pig iron around 50,000 tonnes per annum. The total compensation requi-

estimated at about Rs. 120 crores. Since Government is also a major buyer of equipment for Plan programmes, substantial saving in Plan outlay may be expected as a result of the supply of steel and pig iron to equipment manufacturers at concessional prices. There may be an annual saving of about Rs. 50 to Rs. 60 crores in the power and fertiliser sectors alone.

The group has said that for conductor grade aluminium, cable and conductor manufacturers are entitled to aluminium supplies at international prices against World Bank-aided tenders. For power transmission programmes not financed against World Bank aid, the supply of aluminium at international prices plus 25 per cent may be allowed. The scheme for differential pricing can be operated as part of the scheme for pooling aluminium prices.

The group has suggested that alongwith the technology upgradation scheme (TUS), a scheme similar to the one adopted by the British Government be evolved for small medium units to stimulate demand in the capital goods sector.

To rescue the machine tools industry in the UK, the British Government had evolved a scheme of financial assistance in the form of 33.33 per cent grant plus soft loan to small and medium units for acquiring advanced capital equipment manufactured in UK. This resulted in upgradation of technology across the board in small and medium sectors. It also generated considerable demand for machine tools which in turn pulled the British machine tool industry out of the recessionary phase.

The group has said special efforts should be made for the integration of electronics industry with the capital goods industry. Import of raw materials, components, sub-assemblies (including electronic attachments like CNC, micro-processor based controls etc.), which are available indigenously, should be liberally allowed.

To accelerate the pace of "electro-nification of capital goods industry" the group has suggested that the world leaders in the field of electronic control system like Fanuc of Japan and Camou of Italy be invited to set up manufacturing facilities in



## Shortfall in crude target likely : OIL's poor-show

Thanks to continued dismal performance of Oil India Ltd. (OIL), the country may miss the Seventh Plan crude production target, though by a whisker.

According to Petroleum Ministry sources, during the first three years of the Plan, OIL produced a total of 7.72 million tonnes of crude, over 11 per cent short of the target of 8.71 million tonnes for this period.

Going by the present trend, OIL at best is expected to end up the Seventh Plan with a cumulative crude output of 13.29 million tonnes, showing a shortfall of 1.70 million tonnes over the target of 14.99 million tonnes. But this slippage is expected to be made up to a great extent by the Oil and Natural Gas Commission (ONGC) which is slated to contribute 142.79 million tonnes out of the total Plan target figure of 157.78 million tonnes.

Against a target of 82.10 million tonnes fixed for the first three years of the Seventh Plan for ONGC, it has produced 83.28 million tonnes. The year-wise break-up (with the

target figures in brackets) is: 1985-86 27.51 million tonnes (27.11 million tonnes), 1986-87 27.86 million tonnes (27.37 million tonnes) and 1987-88 27.91 million tonnes (27.62 million tonnes).

The optimism to reach the target follows from the assumption that even if the Commission just manages to hit the target fixed for it at 29.28 million tonnes for 1988-89 and 31.41 million tonnes for 1989-90, it would be able to produce a total of 143.97 million tonnes of crude, i.e., over one million tonnes more than its target of 142.79 million tonnes and, in the process, to compensate for slippage by OIL to a large extent.

Taking together the cumulative contribution by OIL and ONGC during the Seventh Plan expected at 13.29 million tonnes and 143.97 million tonnes respectively, the country will thus be able to produce 157.26 million tonnes. And with little extra effort by the two organisations, Petroleum Ministry sources say that it should not be difficult to bridge the gap estimated at

0.52 million tonnes between the target and the expected performance.

A notable feature of the Seventh Plan has been a build-up in the geological reserves by ONGC. As against a target of 1970 million tonnes reserve accretion during the Plan period, already 823 million tonnes of oil and oil equivalent of gas (OEG) have been added in the first three years of the Seventh Plan (1985-88). The reserve accretion during the Eighth Plan is projected to be 1,220 million tonnes.

Meanwhile, ONGC is reviewing its target for the Eighth Plan, keeping in view the large number of discoveries made in the recent past, both onland and offshore. As per the existing Plan, the cumulative production for the Eighth Plan is expected to be about 280.7 million tonnes of oil and OEG (187.660 million tonnes of oil and 93.016 million tonnes of gas).

The cumulative production during the Ninth (1995-2000) and Tenth Plans (2000-2005) has been projected to leap to 368.07 million tonnes (oil 238.630 million tonnes and gas 129.444 million tonnes) and 460.643 million tonnes (oil 298.520 million tonnes and gas 162.123 million tonnes).

### ONGC TO ISSUE BONDS IN JAPAN

Oil and Natural Gas Commission (ONGC) proposes to issue public bonds in the Japanese capital market. This would make it the first Indian borrower to tap the Japanese Samurai bond market.

Only recently the commission has concluded its Swiss franc public bond issue in the Swiss capital market totalling SF 150 million. These bonds were issued by ONGC at a premium of 100.125 and carries an interest rate of 5.375 per cent per annum for the bonds. The bonds with 10 years bullet maturity will be listed in all major stock exchanges of Switzerland.

ONGC has tapped various international capital markets for raising foreign commercial loans. It has used various techniques like floating rate note, syndicated dollar loan, instalment sale asset financing tax spared loans and private placement bonds in various currencies as part of its portfolio risk management.

Incidentally, ONGC meets 90 per cent of its budgetary requirements through internal resources and remaining are met through commercial borrowings.

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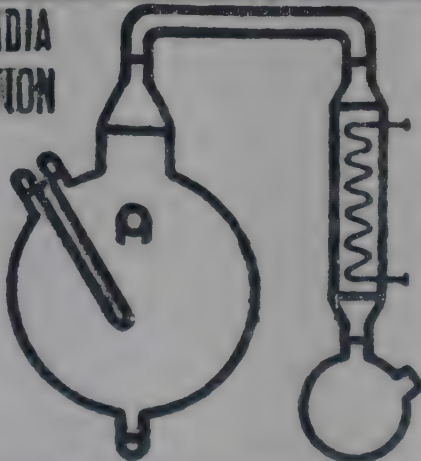
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## 8TH PLAN TARGET

## ONGC to intensify exploration

The Oil and Natural Gas Commission (ONGC) will intensify its exploration programme to reach the output target of 45 million tonnes per year by the end of the 8th Plan. At present ONGC is producing 29 million tonnes of crude oil per year, meeting the country's requirement to the extent of 65 to 70 per cent.

Mr. A.T.R. Raju, Director of the Institute of Reservoir Studies (IRS) set up by ONGC told 'Financial Express' that ONGC has planned to intensify its activity in the oilfields of Cambay, Bombay High offshore, Krishna Godavari basin, Cauvery basin, Upper Assam, Naga hills etc.

He disclosed that ONGC will take up exploration work in Vietnam shortly. Negotiations with the Tanzania Government for exploration is in an advanced stage, he added.

He pointed out that IRS has developed the expertise and is capable of providing consultancy to various outside agencies in the area of reservoir engineering. The institute has successfully carried out consultancy projects for Oil India Ltd and Iraq National Oil Company. Presently proposals are in hand for providing consultancy services to Libya, Burma, Malaysia, etc., he said.

"We have identified thrust areas for the future," said Mr. Raju. More reliable and accurate reservoir models will be used for reservoir simulation studies. To meet immediate future needs, to enhance recovery and the production potential, ONGC is concentrating on polymer and thermal recovery through expansion of the pilots.

To meet future needs ONGC has intensified investigations on several other enhanced oil recovery (EOR) processes, including miscible hydrocarbon process for application in Bombay High, where even after water flooding 800 million tonnes of oil will be left behind.

Numerical models and accurate reservoirs characterisation are other thrust areas where dedicated groups are working. ONGC is concentrating its efforts to develop techniques for well stimulation in tight gas sands and fractured reservoirs. Water shut-off from producing wells

through chemical treatment is another priority area. In certain frontier areas like horizontal well performance studies, microbial enhanced oil recovery, indigenous development of EOR chemicals etc, "we have taken the initiative to develop the expertise ourselves," he stated.

According to Mr. Raju, during the last 10 days the institute completed more than 700 projects at an expenditure of nearly Rs. 23 crores. If the same amount of work is required to be carried out through foreign consultancy it would have cost ONGC more than Rs. 150 crores.

Through the development of in-house capability for undertaking studies related to various areas of reservoir engineering, the institute has saved a considerable amount of foreign exchange. Besides savings in monetary terms in areas of oil field development and operations technology, there are areas where even consultancy with heavy prices would not have been available in high-tech and frontier areas like EOR which have been developed in IRS. In these areas any technology from an outside agency would involve high premium and they remain closely guarded secrets of the international oil companies.

The Gandhar field discovered in March 1984 had emerged as one of the most promising discoveries of the Sixth Plan after Bombay High. The field has already been put on an early production system since May, 1986, and the present rate of production is about 1,000 TPD. The development of the field has been taken up on a crash programme basis. The field is expected to have an ultimate potential of about four to 5 million tonnes of oil per annum.

The Cauvery basin is emerging as a major producer on the oil map of the country. Major hydrocarbon discoveries in the basin include Kovvilkalappal, Narimanam, Bhuvanagiri and Nannilam in Thanjavur and South Arcot district of Tamil Nadu.

So far the entire production from the cauvery basin is being sustained through the early production sys-

tem at Narimanam, Kovvilkalappal and Bhuvanagiri. About three lakh barrels of oil has so far been supplied to the Madras Refineries from these three structures.

About 26 discoveries have been put on early production system (EPS), out of which 25 are onland, while one is offshore. This has resulted in a foreign exchange saving of about Rs. 80 crores per annum.

## ONGC GAS FOR RSEB

The Oil and Natural Gas Commission (ONGC) has finalised an arrangement for the supply of 50,000 cubic metres of gas per day to the Rajasthan State Electricity Board for power generation.

A 23-km, eight-inch gas pipeline from Manhera Tibba to Ramgadh undertaken by ONGC for the supply of gas has been synchronised with the commissioning of gas turbines by the state electricity board, an ONGC spokesman told PTI in Baroda on June 28th.

Exploratory efforts by ONGC have helped in establishing two gas fields at Manhera Tibba and Ghotaru so far. The initial geological reserves of Ghotaru field have been estimated as 634 million cubic metres. The production from the field is expected to be about 1,00,000 cubic metres per day from five wells. The estimated initial geological reserves of the Manhera Tibba field are estimated to be 772.3 million cubic metres and the estimated optimum potential of the field is about 55,000 metres per day.

The hydrocarbon potential of Rajasthan, which is mainly a gas producing area, is rated high and the probable reserves of the area under ONGC comprising western and south-western part of Jaisalmer basin are estimated to be of 50 MMT of oil and oil-equivalent of gas.

A notable feature of gas produced from the Ghotaru and Manhera Tibba fields is that it had indicated traces of helium which could be extracted economically. Helium, as one of the rare gases, has unique properties which could make it increasingly valuable to industry and science. At present, all the current requirements of helium have been met.



## GAIL's efficiency doesn't pay

Gas Authority of India Ltd. (GAIL) is estimated to have suffered a loss of around Rs. 73 crores in 1987-88, making it one of the losers in the public sector.

While the losses of other public sector units reflect inefficiency, GAIL's losses are due to its relative efficiency. Its giant Hazira-Bijapur-Jagdishpur pipeline was completed half a year behind schedule. But several fertiliser and power plants to which it was supposed to supply gas have failed to materialise, and three fertiliser plants are still at the talking stage.

The NTPC power plants at Kawas, Anta and Auriya are unlikely to come up till late 1989. So the HBJ pipeline is handling barely one-third of the gas which it was supposed to.

Depreciation and interest on its mammoth investment of Rs. 1,700 crores exceeds Rs. 300 crores a year and cannot be recouped in the absence of enough gas offtake. The loss of gas sales is more than Rs. 1 crore per day. Creative accountancy can be used to improve the profit and loss account, but a massive loss is still going to appear on GAIL's balance-sheet.

Unlike other losing public sector companies, GAIL may be able to get out of the red within a year. This is because it has obtained permission from the Government — after delays running up to 12 months — to build spur lines to supply gas to other customers such as the Badarpur power station in Delhi, Indian Petrochemical Corporation Ltd., Gujarat State Fertiliser Co. in Vadodra and some of the industrial belts around Delhi (Okhla, Gurgaon, Ghaziabad and Faridabad).

The immediate outlay of GAIL on these spur lines will be between Rs. 50 crores and Rs. 60 crores. The spurs will pay back this investment within eight months through increased profits. That should improve the look of the company's balance-sheet next year.

Indeed, despite being in the red, GAIL hopes to be able to set up a separation plant for LPG (liquefied petroleum gas) at Bijapur at a cost of Rs. 350 crores without any fresh injection of Government funds. Its internal generation of funds through

depreciation is substantial, and the company will be able to borrow large sums from the Oil Development Board. The LPG plant is projected to come up in 1990.

At later stage, the company proposes to set up large petrochemical plants for cracking propane and ethane. These will entail very large investments — the ethane cracker and associated units could cost Rs. 2,000 crores — and may therefore be in the joint sector.

Other proposals for cracking naphtha into petrochemicals are before the Government, such as the

## Call to tap natural gas potential

Natural gas can change the energy scenario of the country, but its planned utilisation has not yet become possible, Mr. Sanat Mehta, former Finance Minister of Gujarat, said recently.

"Although our consumption of petroleum products is fast increasing in spite of higher prices, gas continues to remain an unattended energy source," he remarked.

Mr. Mehta opined that Gujarat has to take the initiative in this area, as it is suffering heavily because of less availability and the ever increasing cost of power. Gujarat has the ability and resources to use this source of energy, he said.

According to Mr. Mehta, in 1987 India's total gas reserves were officially stated to be above 1,005 billion cubic meters. This was expected to go up to 1,231 billion cubic meters. Against such large estimated reserves, the country plans to boost natural gas output from the current level of 18 million cubic meters a day to 50 million cubic meters a day by 1989. As reported by ONGC, the annual utilisation of gas by the ONGC had touched a figure of 6,018 million cubic meters in 1986-87. This implies that this utilisation will have to be scaled to 18,250 cubic meters annually.

"The question, therefore, is how shall we achieve this stupendous task? The present utilisation is mostly of associated gas. We have not been able to plan the use of natural dry gas till this day. Even today, we do not know when will the gas of Bassein be used as it still awaits desulphurisation. The expected use of gas through the HBJ pipeline con-

one at Haldia. But GAIL has argued that gas-based petrochemicals are far more economical. The yield of ethylene and propylene from cracking gas is as high as 86 per cent, but the yield from cracking naphtha is between 53 and 57 per cent. The capital cost of a gas cracker is also lower than that of naphtha cracker.

For political reasons there is a strong lobby for naphtha crackers (the West Bengal Government claims that it will be political discrimination if it is denied a naphtha cracking complex at Haldia), but gas-crackers make far more economic sense, especially at a time when gas is being flared for want of takers.

continues to remain a dream and plans are now under way to take this gas to Delhi for generation of power," he said.

As against this, exploitation of gas fields like north and south Tapti structures and the whole of the Gulf of Cambay is awaiting exploitation. Even the recently struck Gandhar field, which is claimed to be bigger than Ankleshwar, is having almost half gas and half oil. Along with many untapped reserves, large quantities of associated gas thus continues to remain unutilised.

Apart from the six-fold rise in cost and freight of coal, Gujarat has not been able to get coal linkages for its new thermal stations. The coal linkage for its thermal station near Shinor on Narmada, which has been under various types of considerations since the last five years and is yet to receive a clearance, is an indicator to this.

What is the net result? Fuel cost for power generation in Gujarat reached 36.41 paise/kwhs as against an average of 17.69 for all electricity boards in the country. This implies that the fuel cost of Gujarat for power was almost double in the Sixth Plan period.

An interesting discussion is likely to take place at a seminar on "Natural gas — its impact on the economic development of Gujarat," to be held on July 2. The seminar will be inaugurated by the Union Energy Minister, Mr. Vasant Sathe. Mr. Sanat Mehta, in his capacity as the President of the Gujarat Foundation for Development Alternatives, which has organised the seminar, will speak on this vital issue.



# COMPANY NOTES

## Kalpana Chemicals Pvt. Ltd.

Kalpana Chemicals Pvt. Ltd. is a Technocrat Small Scale Industry started in 1975 and being run by Mr. B. N. Murthy and Mr. J. K. Arya. The company is manufacturing Sodium Carboxy Methyl Cellulose, etc. Kalpana Chemicals Private Limited has been supplying CMC of oil drilling grade to M/s. Oil India Limited for the past seven years, and the Oil & Natural Gas Commission.

The company has its own R&D Division and knowhow is entirely developed by them. The pilot plant of Chrome Lignite was successfully operated and M/s. Oil India Ltd., was supplied from this production about 100 tons material which was accepted as superior to imported material. M/s. Hoechst India got the material tested in Germany and have given the opinion that the product is far superior than any other Chrome Lignite available.

M/s. Industrial Reconstruction Bank of India has given a term loan of Rs. 42 lacs. The company has put up 2,200 tons capacity automatic plant designed entirely by the company.

Oil & Natural Gas Commission was initially reluctant to support the unit as against imports. However, Hon. Minister of Petroleum Mr. Brahm Dutt was very particular that indigenisation of petroleum chemicals should be encouraged, and as such asked Oil & Natural Gas Commission to reserve some quantity for indigenous suppliers. Thus O.N.G.C. was pleased to place a 700 tons order for supply of Chrome Lignite with the

company at a value of Rs. 38 lacs plus duties and taxes.

Kalpana Chemicals Private Limited has already developed the process for the manufacture of Ferro Chrome Ligno Sulphonate which is already approved by M/s. Oil India. Similarly KCPL R&D is confident of developing Soltex and poly amionic cellulose for oil drilling. As of today KCPL has completed more than a crore of deemed exports supplied to O.N.G.C. and Oil India Limited. There are some problems faced by the company in making the supply to ONGC under Deemed Export programme. The licence for the import of raw materials envisaged in the import policy have been given by the Government in some cases and in the present case they have not yet issued the licences inspite of lapse of 8 months, whereas the company had to complete the order within the stipulated time thereby incurring heavy loss in procuring the raw material from the market. Also ONGC pays foreign suppliers against LCs whereas local suppliers have to run from pillar to post and project to project for getting 90% of payment and balance 10% is uncertain without any time limit.

### DUPHAR-INTERFRAN

The sales of Duphar-Interfran during the current year at Rs. 866.lakhs, are higher by Rs. 148 lakhs, compared to the corresponding period in the previous year, an increase of 21 per cent.

Addressing the shareholders at the company's annual general

meeting Mr.D.G. Rajan, Chairman of the company said that with higher turnover and improvement in productivity, the company would make all-out efforts to maintain the profitability. Though it faces difficulties with the announcement of new DPCO which affects production of Crocin.

He said that the sales turnover recorded a growth of 19 per cent in 1987 this includes a significant growth of 20 per cent in pharmaceuticals. The pre-tax profit increased from Rs. 46.96 lakhs to Rs. 59.42 lakhs. Profit would have been higher, but for provision of accelerated depreciation of Rs. 112.36 lakhs. In order to ensure higher productivity in the manufacturing operations, investments to the tune of Rs. 2.24 crores in building, plant and machinery and other assets were made during the year.

In view of the provisions of the Direct Tax Laws (Amendment), Act 1987, the board at its meeting held has extended the current financial year up to March 1989, and has decided to have the financial year of the company from April to March, he added.

### BIOCON INDIA

Biocon India Private Limited was founded in 1978 in collaboration with Biocon Limited, Ireland, and has grown from a modest sized company into a leading supplier of enzymes and other natural extracts to the Food, Beverages and Pharmaceutical Industries.

Biocon's headquarters are in Carrigaline, Co. Cork, on the Southern coast of Ireland and the Biocon group operates through 23 manufacturing and marketing companies throughout Europe



North and South America, Asia and Australia.

In the past 10 years, Biocon has expanded its manufacturing facilities on the international front and today comprises of the Indian operation which produces and colours; a natural colours enzymes, collagen, natural gums plant at Lima, Peru; a Carrageenane production unit on the island of Cebu in the Philippines, and a large enzyme fermentation plant at Ireland.

Biocon India has a sophisticated and modern plant set in elegant surroundings at Hebbagodi, 20 KM from Bangalore. The Company incorporates a DST-recognised Research and Development Laboratory for applied research. Quality control is an integral part of the Company's operations and a well-equipped Quality Assurance Laboratory ensures products of a consistently high quality.

The range of Products for the Food, Beverage and Pharmaceutical Industries include; Enzymes for food applications; fruit processing; baking and milling; dairy; brewing; distilling; starch; Pharmaceuticals. Hydrocolloids such as Carrageenan; Isinglass; Propylene glycol alginate. Natural Colours including Turmeric; Annatto and Carmine. Analytical Products such as Beta glucan substrate; Beta glucan assay kit; Alpha amylase assay kit; Glucose assay kit.

#### **E. MERCK (INDIA)**

E. Merck (India) has got approvals from the Government for introducing and marketing more essential pharmaceutical raw materials and formulations. In addition, the company has acquired a bulk drug unit at Indore for the manufacture of chloro-

quine phosphate and its derivatives according to Mr. S. N. Talwar, Chairman of the company.

Addressing shareholders at the company's annual general meeting, he said that a modern pharmaceutical plant in accordance with Merck International standard was being set up in Goa. The existing capacities for production of vitamin E and the BDH were being enhanced to meet the growing demand for the company's products. All these measures should contribute to the healthy growth of the company in years to come.

He further said that as consequence of reduction in the foreign equity from 51 per cent to 40 per cent, the company had been able to take several steps towards expansion and diversification. The change in the capital structure enabled the company to introduce several life saving and essential products which had been well accepted. The year 1988, therefore, had begun well and the turnover in the first five months had been Rs. 17.18 crores recording a growth of 27 per cent over the same period of 1987. Barring unforeseen circumstances, the company should show better results in the current year, he added.

#### **PINE CHEMICALS**

Pine Chemicals has achieved a total turnover of Rs. 86.45 lakhs during the year ended June 1987. This includes turnover of Rs. 14.56 lakhs on account of sale of 'pinsel' diskettes manufactured at the company's computer diskette plant at Noida which commenced commercial production in March 1987. The turnover of Rs. 71.89 lakhs consists of sale of carried over

stocks of the chemical division at Jammu which the company was forced to close down in April, 1986 due to enactment of the J and K Extraction of Resin Act 1986.

The company earned a gross profit of Rs. 12.43 lakhs against Rs. 158.72 lakhs. After depreciation (Rs. 6.49 lakhs against Rs. 10.40 lakhs), investment allowance reserve (Rs. 3.50 lakhs against nil), loss on discarding of assets (nil against Rs. 69.86 lakhs), and taxation (Rs. one lakh against Rs. 44 lakhs), the net profit amounted to Rs. 1.44 lakhs against Rs. 34.47 lakhs. After certain adjustments, the profits available for appropriation amounted to Rs. 14.78 lakhs against Rs. 34.53 lakhs. The proposed 10 per cent dividend and preference dividend will absorb Rs. 12.61 lakhs.

The scheme of amalgamation of Pinsel Computer Products Ltd. a wholly owned subsidiary with the company has been approved. Accordingly, the entire undertaking of Pinsel along with its properties, assets, rights, debts, liabilities, duties and obligations have vested with the company with effect from January 1, 1987.

The excess of assets over liabilities taken over being the purchase consideration has been discharged by surrendering the equity shares of Pinsel held by the company and cancelling the unsecured loan given by the company to Pinsel. The effects of the amalgamation have been dealt with in the accounts for the year under review. The name of the company will subsequently be changed to Pinsel Computer Products Ltd.

The company has also started leasing activities on a moderate scale in the current year from



July 12, 1988

October 1987 which is expected to increase during the coming years.

### KHATAU MILLS

Khatau Makanji Spinning and Weaving Company has produced poor results for 1987. The turnover has dropped to Rs. 86.87 crores from Rs. 96.87 crores last year. The operating profit has slumped to Rs. 367.87 lakhs from Rs. 786.13 lakhs.

After interest charges (Rs. 570.26 lakhs against Rs. 586.89 lakhs) and depreciation (Rs. 5.35 lakhs against Rs. 181.34 lakhs), there is a net loss of Rs. 207.74 lakhs against a net profit of Rs. 17.90 lakhs a year ago. After adjustments there is a loss of Rs. 195.18 lakhs against a surplus of Rs. 62.22 lakhs last year. The carry-forward deficit is Rs. 320.51 lakhs against a surplus of Rs. 66.75 lakhs.

### INDORAMA SYNTHETICS

The Lohias of Indonesia, with industrial interests in textiles, steel and chemicals, have promoted a company, Indorama Synthetics (India) Ltd., to put up a modern synthetic yarn unit at a cost of Rs. 21.36 crores under the 40 per cent non-resilient Indians investment scheme.

The director of the company, Mr. O. P. Lohia, said that the 25,000-spindle capacity unit will come up at Pithampur in Madhya Pradesh and will go on stream by the end of the year.

Mr. Lohia said since the entire promoter's equity will come in foreign exchange, the company has been allowed to import some

critical equipment. The project will also enjoy certain locational advantages, including proximity to the market and backward area benefits.

### DEEPAK FERTILISERS

Deepak Fertilisers has earned a gross profit of Rs 13.38 crore during the 15-month period ended March 1988 against Rs 13.57 crore in the previous period of 12 months. Depreciation has been provided with a sum of Rs 8.18 crore against Rs 6.81 crore.

After providing Rs 83.96 lakh (nil) for taxation, the company has earned a net profit after tax of Rs 4.49 crore as against Rs 5.90 crore in the previous year.

The directors have recommended a dividend of 18.75 percent which on the 33 27,900 equity shares issued during the year to the financial institutions on conversion of a part of their rupee loans into equity shares will be paid pro-rata for the period from August 1, 1987 absorbing a sum of Rs 2.49 crore.

Production during the period under review was 98,740 MT and sold 99,831 MT as against a production of 90,287 MT and sales of 94,116 MT in the previous period of 12-month period.

The company has taken up for implementation a diversification programme for the manufacture of industrial chemicals, namely nitric acids, ammonium nitrate and methanol. The Government has approved the foreign collaboration agreements and CG imports for these projects.

The total cost of this diversification programme is estimated at Rs 170 crore with a scheduled

completion target of end 1990. The company's application to the financial institutions has been approved and a formal letter of sanction is awaited.

The company has also been issued a letter of intent to set up a plant for production of ammonium nitrophosphate fertiliser with a capacity of 765 MT per day.

During the first two months of the current year, the company has produced 16,199 MT of ammonia and sold 17,946 MT. The company hopes to sell not less than 90,000 tonnes of ammonia during the current year.

### HINDUSTAN POLYMERS NEW PLANT

The Rs six-crore expandable polystyrene beads plant of Hindustan Polymers division of the McDowell and Company, a subsidiary of the United Breweries group, was commissioned by Vijay Mallayya, Chairman of the United Breweries Group in Visakhapatnam on June 27.

The plant, the second of its kind in the country, has been set up with the latest technology from Sunde Plastic Industries, Norway and is the first diversification project of the Hindustan Polymers division which has so far been manufacturing only styrene and polystyrene.

Hindustan Polymers, which has a major share of styrene and polystyrene market in the country are making rapid progress in expanding plant capacities of styrene and polystyrene to be able to meet the growing demand for these products.



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## SPOTLIGHT ON

# Biotechnology & Life Sciences (Part 1)

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## THE STATUS OF BIOTECHNOLOGY – A TECHNO COMMERCIAL UPDATE

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A new report "The Status of Biotechnology" has been released last December by Market Intelligence Research Company of Mountainview, California, USA. Biotechnology as defined by this report included primarily the use of recombinant-DNA, monoclonal antibodies, and advanced somatic cell techniques in the production of new pharmaceuticals, diagnostics and agricultural products. These technology can be applied to a wide variety of existing markets, in many cases greatly expanding them. In other cases, entirely new markets have been created. This report provides a detailed overview of the many uses of these new technologies and profiles of some of the key competitors in specific arenas.

In medicine, the use of r-DNA and monoclonal antibodies (MABs) has the potential to revolutionize the detection and treatment of serious medical conditions such as cancer and heart disease. The earlier diagnosis and monitoring capabilities afforded by the use of MABs or gene probes allow for improved conventional therapies. The use of targeted immunotoxins at new therapeutics such as tPA will add greatly to the medical community's therapeutic arsenal.

Agriculture is another key area for biotechnology breakthroughs. Key applications include vaccines for animal diseases, improvements of animal productivity and development of new plant varieties resistant to stress and herbicides.

Markets analyzed include human insulin growth factors, lymphokines, new vaccines, blood products, tissue Plasminogen Activator (tPA), SuperOxide Dismutase (SOD) and MABs as therapeutics.

Key features of this report include a discussion of how this industry has impacted the investment community; a thorough overview of the science behind the biotechnologies; discussion of the major near term applications of biotechnology; discussion of the theoretical potential for growth and development of the markets for each of the biotechnology applications discussed; examination of strategies for start-ups and new trends in the biotech industry.

In-depth competitors profiles include each company's financial background, contacts, product analysis, company strategy and special situations.

*The report is available from Market Intelligence Research Co., 2525, Charleston Road, Mountain View, CA 94043; Price \$995.*

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## RESISTANT GENES TO BE EMPLOYED TO SAVE US BEE INDUSTRY FROM ASIAN MITE

---

The discovery of the Asian mite *Varroa Jacobsen* in Wisconsin and 10 other states means that all 3.5 million colonies in the US honey bees are imperilled, reports entomology professor Roger A Morse of Cornell University. At stake is the \$130 million worth of honey made in the US yearly and the \$20 billion worth of crops pollinated by bees.

For controlling the spread of the mite in the short term, Prof. Mores

sees promise in careful use of fluvalinate a broad-spectrum insecticide that is much more toxic to mite than to bees. However, the insecticide must be used in ways that do not leave residues in honey-comb wax that could migrate into honey. One way would be to treat worker bees that are shipped to beekeepers for starting new colonies or used as attendants to queen bees in shipment. Because workers live only 5 weeks their descendants in new colonies would be both mite and insecticide-free.

For the long term, it may be possible to breed mite-resistance into US bees. In work with research associates Scot Camazine in Brazil and Richard Nowogrodzki in Ithaca, N.Y. Morse has found that Africanized bees are mite-resistant, offering hope that resistance genes also exist in domestic bees. (*C & EN*, 1/25/88, p. 16).

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## THERMOPHILIC BACTERIA FIND NOVEL APPLICATION IN CONFECTIONERY

---

The idea of using thermophilic bacteria that live naturally in hot springs is not new, but it has not been exploited. Now researchers at the University of Kent (UK) have found a way to use them. Bacteria which live at 65°C expend a great deal of energy maintaining themselves against heat stress. They have little left to meet the demands of extra genes implanted into them by biotech researchers. Any such genes are rapidly expelled, unless they are very firmly anchored.

David Hardman at the University's biotech centre has developed a system for inserting extra copies of



genes for enzymes into a thermophile and anchoring them in place. *Bacillus stearothermophilus* has a lipase enzyme that can help break down fats into smaller molecules for use in confectionery. Its working temperature 65°C kills other micro-organisms sterilising the product. The fats liquefy, making solvents unnecessary. This saves money and prevents hazards from solvent residues. (*New Sci.* 3/10/88, p. 38).

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### WORLD CONFERENCE ON BIOTECHNOLOGY FOR THE FATS & OILS INDUSTRY

---

Approximately 500 technical registrants and company exhibit representatives attended the World Conference on Biotechnology for the Fats & Oils Industry in Hamburg, West Germany, during September 27-October 2, 1987.

Primary organisers were the American Oil Chemists' Society (AJCS) and the German Society for Fat Research (DGF). Other participating organisations included the Institut des Crops Gres, the Japan Oil Chemists Society and the Stazione Sperimentale degli Oli e dei Grassi.

In five days of lectural sessions, registrants from 40 countries head talks ranging from modification of plants and fats and oils through manipulative engineering to regulatory action related to biotechnology. Invited speakers came from the USA, West Germany, Japan, UK, Canada, Australia, Denmark, France and the Netherlands.

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### AN UPDATE ON JAPANESE BIOTECH ADVANCE

---

Japanese biotechnology is growing fast and is about to enter the first stage of commercial production according to a recent study by the US national Science Foundation.

The Japanese are particularly strong in medical and agricultural fields. Japanese attention is shifting to the technology essential for the output of end products.

Although the Japanese firms believe themselves to be behind the USA in many important areas, they think they are ahead on bioprocessing. Meija Seika claims to have passed its US competitors in antibiotic production technology, and both Sumitomo Pharmaceutical and Toray Industry as a result of their work on interferon have become world leaders in high volume cell production. (*Chem. in Brit.*, 6/1987, P. 518).

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### JAPAN PROPOSES MASSIVE INTERNATIONAL COLLABORATION IN BIOLOGICAL RESEARCH

---

The human frontier, Japan's proposal for massive intern collaboration in biological research, came a little closer to definition last March as scientists and officials from Europe and North America met in Tokyo to hear long awaited details on the project's scope and funding. From this discussion it appears that the programme would be smaller and less international than expected.

The former Prime Minister of Japan Yasuhiro Nakasone, proposed in 1986 to spend \$6 billion over two decades on a wide range of topics in biology, energy and environment, in what was seen as a Japanese bid to catch up other scientific powers in basic research.

That has now been modified. As reported by Tateshi Arimoto, the spokesman for the Human Frontier Programme in Tokyo after the meeting, Japan will release 30 to 50 grants per annum, each of around \$500,000 for the programme, as well as 100 to 200 fellowships and 10 to

20 yearly workshops. The grants will be awarded by an international board of scientists.

Japan will spend \$2 million starting April 1988, on the Human Frontier Programme but the grants and workshops will be in Japan. An 'international' office for the programme might be set up in 1989.

The European and North American scientists who have been discussing the programme with the Japanese since last November 1987, will complete a report on proposed subjects for funding in 1988. The Japanese will visit Western capitals to try and attract support.

They might encounter problems. The West fears that the programme will fuel a 'brain-drain' of expertise to Japan in areas like molecular biology and neurophysiology.

Heinz Riesenhuber, West Germany's research minister emphasizes that the programme must be a 'real partnership with no leads', and agreed with the statement by Michel Poniatowski, who chairs the European Parliament's research committee, that Europe should match Japan's contributions to the project from the very beginning. (*New Sci.*, 3/10/88, p. 22).

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### METAL-TOLERANT PLANTS PRESENT A GREAT CHALLENGE TO PLANT PHYSIOLOGISTS & GENETICISTS

---

Plants need metals if they are to grow and develop properly. They need more of some metals than others. Metals such as potassium and calcium are required in relatively large amounts, and an excess of either does no harm. Other metals, such as copper and zinc are essential for activity of vital enzymes, but any more than a trace amount damages these enzymes irrever-



sibly. Soils that contain high concentrations of such metals are usually extremely toxic.

Some plants grow in these toxic soils; either they limit their uptake of the metal or they have an internal mechanism that renders the metal harmless. Tolerant plants have high concentration of metals in their tissues. Clearly, they must have evolved a way to protect their life processes.

Molecular biology may hold the key to the mechanisms of metal tolerance. Researchers at the University of Liverpool (UK) showed recently that copper-tolerant plants have genes that are turned on in the presence of high concentrations of copper.

The researchers are now trying to find out whether these genes code for enzymes involved in the production of phytochelatins, or for other molecules involved with a copper tolerance. Phytochelatins bind metals via cysteinyl residues.

Clearly, we need to do much more research on the nature of the mechanism, rather than on the products of its activity, if we are to find out how it works. Eventually we may be able to regulate tolerance and routinely introduce this ability into normally intolerant species. Such an ability has exciting implications in a world increasingly polluted with heavy metals.

Metal accumulating plants are uniquely adapted to a hostile environment. Because of this they can teach us much about plant physiology and evolutionary processes. By their very nature they are vulnerable to extinction and need protection if we are to conserve a valuable genetic resource. Genes for metal tolerance might have many uses, if not in their own hosts then perhaps, in

other organisms. Doubtless, the continuing quest for plants that accumulate metal will uncover more species with this extreme physiology. It remains to be seen whether accumulators exist for the more uncommon metallic elements and whether researchers will find that elusive accumulator of gold (*New Sci.*, 3/10/88).

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### BIOTECHNOLOGY SPAWNS A NEW WONDER DRUG ERA IN USA

---

Jeffrey Casdin of Casdin Associates, a biotech investment firm, believes the American drug industry is embarking on "another wonder drug era" having seen the first one in the 1950s and 1960s with the development of birth-control pills and antibiotics. At the peak of the last "wonder drug age" companies earnings were twice that of the stock market as a whole and this could happen again.

But this time scientists are producing drugs by understanding how the body functions at a molecular level, drug life cycles will be reduced as newer drugs that address underlying diseases rather than treat symptoms render older medications obsolete. For instance, the implantation of insulin-producing cells is expected to replace the need for insulin, or immune blockers could stop diabetes, an auto-immune disease, altogether.

Mr. Gasdin believes that within 25 years, biotech companies in USA will take half of total pharmaceutical revenues. What is more, smaller dosages of biotech drugs are needed, making capital costs for biotech innovators less expensive.

For instance, one kilogram of Amgen's erythropoietin, which builds up red blood cell counts, can satisfy entire world's requirement. Erythro-

poietin is expected to win FDA approval in late 1988, with expected sales of \$300 million by 1991. A players such as Amgen and Genentech prove successful, more conservative capital will pour into biotech sector.

So far \$2 billion in capital has flowed into about 15 companies in USA, comprising 60% of the market. Besides Amgen and Genentech other major stock picks include Genocor, Genetics Institute, Xoma, Chiron, Immunex and Genzyme (*CMR*, 3/14/88, p. 29).

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### AN IMPROVED POLYMERASE CHAIN REACTION UNVEILED BY CETUS CORPORATION

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Cetus Corporation has upgraded its polymerase chain reaction (PCR) gene amplification technology using a heat-stable enzyme that synthesizes DNA. The improvement greatly simplifies the PCR procedure which has widespread application in molecular biology, diagnostics, genetic disease research and forensics.

One immediate application of this gene amplification technology is in detecting the latent AIDS virus (HIV). The AIDS virus can be present in the body but remains inactive or dormant for long periods of time. For that reason it is important to be able to detect the viral DNA that is preset even when the virus is latent. The high specificity of the improved PCR procedure enables scientists to detect single molecule of viral DNA when it is present among one million cells.

PCR involves as many as 30 repetitive heating and cooling cycles. Each cycle reaches high temperatures that inactivate the DNA polymerase enzyme previously used in the reaction. The inactivation made it necessary to add enzyme at the beginning of each subsequent cycle,



a cumbersome and time-consuming procedure.

Cetus researchers isolated a DNA polymerase from the bacterium *Thermas aquatians* which thrives in hot springs. This heat stable enzyme known as Taq polymerase does not inactivate itself at high temperatures, thus eliminating the need to replenish enzyme after every PCR cycle.

"This modification not only simplifies the procedure, making it amenable to automation. It also improves substantially the overall performance of the reaction by increasing the specificity, yields, sensitivity and length of targets that can be amplified" reports Jeffrey S. Price, senior Vice-President of R & D at Cetus.

The sensitivity of the PCR procedure has also proven useful in forensic analysis, when only minute amounts of material are available.

For example, human hair is the most common evidence found at the scene of a crime and the DNA in the person's hair is the same as the DNA in the rest of the body. PCR enables amplification of the target DNA in a single human hair to permit precise identification of a suspect.

In addition, PCR technology has widespread application in the field of molecular biology and in the development of new pharmaceutical products. "PCR has the ability to replace time-consuming elements of laboratory procedures such as gene-cloning and manipulation" the researchers report.

"With this techniques we can accomplish in a three to four hour reaction what might otherwise take days or weeks of biological growth and biochemical purification". (*CMR*, 3/14/88, p. 35).

#### A NEW GENETICALLY-ENGINEERED NITROGEN-FIXING SOIL BACTERIA UNDER FIELD TRIAL

Biotechnica International has started field tests with its genetically engineered nitro-fixing soil bacterium *Rhizobium melitol* on ninety alfalfa test plots at its Chippewa agricultural station. In greenhouse trials the gene-spliced strain increased yields of alfalfa, according to Dr. David Glass, Vice President of Government and regulatory affairs for Biotechnica Agriculture.

USA grows about 25.5 million acres/year of alfalfa producing a total

crop worth about \$7 billion. Conventional strains of rhizobia are used in about 80% of this crop. Because the crop is not in a surplus situation and growers receive a premium price for good quality alfalfa, an increase in yield provided by a competitively priced seed inoculant can mean more profit for growers. This is another example of the contribution of biotechnology (via genetic engineering) for boosting agricultural profitability.

Biotechnica hopes to win government's approval later in 1988 for gene-spliced rhizobia strains specific to nitrogen fixation in soya bean. Company scientists are also working to engineer herbicide, disease, and insect resistance in maize, soya beans, wheat and alfalfa. (*ECN*, 5/2/88, p. 17).

\* Holland Sweetener Company (HSC), a joint venture of DSM and Tosoh Corporation of Japan, has won the legal proceedings it brought against NutraSweet's Swiss patent, which covered the mixing of aspartame sweetener with saccharin or cyclamate. The decision, made by the Canton court in Zurich, flows a similar patent invalidation in the Netherlands.

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# Food & Pharmaceutical Technology in Perspective

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## GLUCONO DELTA LACTONE -- A NEW FOOD ADDITIVE FOR MEAT & POULTRY APPROVED BY USDA

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The US Department of Agriculture (USDA) has recently approved glucono delta lactone (GDL) as an alternate acidic substance (to adjust acid level in meat and poultry products) in a dry binder for restructured meat products.

"Approving GDL for use in meat and poultry will make a wider variety of acidifiers available to processors" reports USDA's safety inspection services. "The substance has unique properties, it is not an acid in the crystalline state but when combined with water it forms a weak bland testing acid".

In USA meat processors have been combining 1.0% sodium alginate, 0.2% calcium carbonate and 0.3% lactic acid and calcium lactate to create a dry mixture that binds pieces of meat to form restructured patties, wafers and other meat products.

The new rule will now allow processors to substitute 0.3% GDL for lactic acid and calcium lactate in the binder. The mixture should not exceed 1.5% of the product's content, which is the level of dry mixture approved by FDA as safe for use in food. The substances must be used in the dry state, since water can cause the binding compound to exceed FDA's standard. (*CMR*, 3/28/88, p. 42).

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## BETA-CAROTENE TOUTED AS A SAFER SOURCE OF VIT. A

---

With free oxygen radical scavengers being touted as a possible treat-

ment for health problems ranging from heart disease to the flu, beta carotene awaits a good potential market in future.

Recent researches have shown that beta carotene is a safer source of vitamin A because it is less toxic and is not stored in the liver like other forms of Vit. A. The retinol originated Vit. A is known to have proteins that attract it to the liver, thus causing a potential over supply of Vit. A.

In a very small percentage of people, the experts say, this build up in the liver might be harmful. In contrast beta carotene is not directed specifically to where it builds up in the body; but is stored safely in the fat cells.

Radical scavengers, according to biochemists, work by countering oxygen radical formation or by hindering their formation. Beta-carotene acting as a radical scavenger sacrifices itself to save healthy tissue that protects body fats against oxidation.

Beta-carotene has become a new nutritional supplement abroad, particularly in USA and Japan. The big growth is foreseen in tablet applications. It will be added to more and more multivitamin preparations. This finding has also given a spurt to production of natural betacarotene. One company is making natural beta-carotene from an algae called *Dunaliella salina*. (*CMR*, 5/2/88, p. 16).

---

## PFIZER DEVELOPS CHYMOSIN ENZYME BY A NEW FERMENTATION PROCESS

---

Pfizer has filed a petition with the USA's FDA involving a new fermentation process developed in its laboratories at Groton, Conn. USA, which will provide a chymosin

enzyme economically in a consistent, stable and highly pure form.

This is the first food additive petition to be filed which involves a fermentation process using genetically engineered microorganism. According to Pfizer, chymosin prepared by fermentation is identical to that obtained from calf stomachs and its cheese making ability has been demonstrated repeatedly in pilot plant tests.

Pfizer plans to manufacture chymosin under the appropriate NIH Guidelines for r-DNA research in a new state-of-the-art facility under construction at its manufacturing plant in Terre Haute, Indiana. The chymosin will be marketed by Pfizer's Dairy Products Group in Milwaukee, Wisconsin.

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## PENICILLIUM LIPASE C FOR PRODUCTION OF HIGH PURITY MONOGLYCERIDES DEVELOPED BY BIOCATALYST LTD

---

The enzyme Penicillium Lipase C is a new lipase developed by Biocatalyst Ltd., (UK) for the production of high purity monoglycerides. This enzyme offers a simpler and more cost-effective alternative to chemical synthesis.

Enzymes are highly specific in their catalytic action and therefore offer benefits over chemical methods of synthesis. Very little diglyceride is formed during synthesis with this enzyme thus producing cost savings in the subsequent purification stages.

Other uses of lipases as catalyst in chemical synthesis include both flavour and pharmaceutical production. Penicillium Lipase C, purified



*Penicillium cyclopium* demonstrates high specificity against monoglycerides with a pH optimum at 40°C. The enzyme is stable for 6 months. (*Food Manuf.* 1/1988, p. 17).

#### **A GUIDE TO FERMENTED FOODS ROUND THE WORLD PUBLISHED BY BUTTERWORTHS (UK)**

The world's first guide to fermented foods consumed round the world has been recently published by Butterworths 1987 under title "Fermented Foods of the World: A Dictionary & Guide".

The author (G. Campbell Platt), whose interest in fermented foods began when he taught at the University of Ghana, has completed a dictionary of over 3,500 foods classified into 250 groups. He has divided fermented foods into nine major classes: beverages, cereals, dairy products, fish, meat, starch crops, fruit/vegetables, legumes and miscellaneous products.

Information is given on the areas in which the fermented foods occur in the world, production techniques, microbiological and biochemical characteristics, composition and nutritive values. Names of foodstuffs are cross referenced throughout. At the end of the dictionary the foods are listed alphabetically, both by region of production and by class.

By its very nature and its pioneering endeavour, such a book is bound to be uneven in the amount of information given for individual foods and the author admits the list is far from complete. It is nevertheless a significant and unique reference source and should prove extremely useful to all those interested in the wide diversity of fermented foods. One wonders, whether the author has described the fermented foods of the Indian sub-continent. If not, Indian food technologists should inform the

author for their inclusion in the future revision of this publication. (*Food Manuf.*, 1, 1988, p. 46).

#### **A NEW EDIBLE OIL SOURCE FOUND BY THE NATIONAL INSTITUTE OF NUTRITION**

Researchers at the National Institute of Nutrition (Hyderabad, A.P.) have found a new source for extracting edible oils from myrobalan fruit of *terminalia bellerica* tree grown in the deciduous forests. Apart from its highly nutritive value, this oil is commercially exploitable. The Kernal of myrobalan fruit is a good source of phosphorus, Ca, Mg, and iron. The new oil has been found to be safe for human consumption and if blended with vanaspati it would make an ideal substitute for groundnut or palmolein oil. (*Commercial Products Finder*, 8/1987, p. 75).

#### **A NEW RABIES VACCINE TO IMMUNIZE WILD LIFE ON THE HORIZON**

The Wister Institute (Phila., Pa) has applied for approval from USDA to conduct field trials of a new genetically engineered rabies vaccine designed to immunize wild life. Unlike traditional rabies vaccine, the new vaccine developed by Wister and Transgene, a French biotech company -- is not made from the whole rabies vaccine. It is made instead, by taking a gene from the rabies virus that codes for a protein on its viral coat and inserting that gene into the vaccinia virus, the virus used to eradicate small pox in people.

The genetically engineered vaccine -- which can be administered orally -- generates antibodies to rabies in the vaccinated animal but cannot cause the disease, because the disease-causing parts of the rabies virus are not present. Wister is considering several uninhabited

islands off the coast of Virginia or South Carolina as potential sites for field trials, which are under way in Belgium and are expected to begin soon in France. (*Chem. Wk.*, 5/18/88, p. 47).

#### **ENZYMES POISED FOR GROWING ROLE IN FOOD PROCESSING**

Novo's recent "Handbook of Practical Biotechnology" (published by Novo Laboratories Inc., 33, Turner Road, Dept. CEP, Danbury CT 06810, USA) gives an excellent update on the role of enzymes in food processing.

Enzymes are nature's versatile catalysts. The food industry takes advantage of their capability to increase product yields and decrease byproducts and reduce energy costs. Biochemists formally classify enzymes into 6 categories according to the reaction catalysed:

- \* Oxidation/reduction,
- \* Ligation,
- \* Hydrolysis,
- \* Transfer reactions
- \* Isomerizations and
- \* Reactions in which they are additions to double bonds.

The extensive applications of enzymes in foods and food processing are covered in brief by Table-1 (see next page). The use of enzymes in food processing has greatly expanded in recent years and covers the following significant purposes: (a) reduce viscosity, (b) improve extraction, (c) carry out bio-conversions, (d) enhance separations, (e) develop functionality, (f) create or intensify flavour and (g) synthesize novel chemicals via fermentation.

Most of the industrial enzymes used to-day in the food industry fall into hydrolytic category. These



Table 1  
Enzyme Applications in Foods & Food Processing

Industry	Applications
Baking	Dough conditioning Flour bleaching Flour malting Anti-Staling
Brewing	Low-calorie beer Chill-proofing Barley brewing Alternative adjunct liquefaction and saccharification
Dairy	Cheese making Accelerated cheese ripening Natural cheese flavour concentrates Whey utilization Lactose-intolerance reduction
Fruit Juice	Mashtreatment Depectinization Starch/Araban haze removal Citrus pulp wash viscosity reduction
Starch	High fructose corn syrup (HFCS) Maltose syrups Dextrin syrups Dextrose
Protein	Rendering Soy milk production Egg-white replacers Emulsifier production Functional hydrolysates
Fats & Oils	Cocoa-butter substitutes Flavour ester synthesis Speciality fats for better nutrition
Pet Foods	Sprayable digests Palatability enhancement Improving extruder performance
Miscellaneous	Meat tenderizing Coffee-soluble-extract viscosity reduction

enzymes characteristically depolymerize their substrates into smaller oligomers and/or monomers. Examples include: proteases that break proteins into peptides and/or amino acids, amylases that hydrolyze starch to dextrins and simple sugars, like maltose or glucose and lipases that split fatty acids off triglycerides. Enzymes have contributed greatly to

the development of novel foods in affluent countries of America, Japan and Western Europe. In contrast, the foods in the third world countries are drab with no variety of novel foods.

Food enzymes have also played an important role in developing a range of soya-based foods in Japan, USA and other affluent countries.

For more information on enzymes in food processing, refer to Novo's Handbook of Practical Biotechnology. For a free copy contact Novo Laboratories Inc. at the address noted on page 82.

### STARTER CULTURES POISED FOR ACTIVE ROLE IN FOOD TECHNOLOGY

In the past few years there has been an increased interest in starter cultures in food technology abroad particularly in Western Europe, USA and Japan. Starter cultures have, been traditionally used in the production of cheese and fermented dairy products, as well as certain meats. With the evolution of these industries from the farm house to the factory, starter cultures have been successfully isolated and adapted in recent years to commercial food technology. The lactobacillic and streptococcal components of these cultures produce lactic acid which lowers pH and serves as a natural preservative. Flavour components produced by the culture also contribute to the characteristic organoleptic properties of cheese, lactic butter, yoghurt and sausages.

According to Prof. Bourgeois of the University of Brest, France, the possibility exists for extending the use of starter cultures to a wider range of food products, thereby reducing the need for artificial preservatives, including nitrates. This is obviously attractive in the current mood of an industry which is anxious to promote a natural image. (*Food Eng. Intl.*, 12/1987, p. 14).

### PLANT CELL CULTURES TO PRODUCE FOOD FLAVOURS AND COLOURS

Researchers at the Botany Department of the University of Edinburgh at the recent Conference on Biotechnology in Food Industry



unveiled an immobilization technique for enzymes based on plant cells. Prof. M. Yeoman reported that plant cells can be immobilized by inert matrices and used to produce food flavour and natural colours. Plant cell cultures in future could offer the food industry a convenient and economic source of natural products which may be difficult or costly to synthesize chemically. This technique in future can develop a technology for producing natural flavours and colours on a commercial scale. (*Food Eng. Intl.* 12/1987, pp 14, 16).

### **VOLUNTARY STANDARDS FOR NATURAL HEALTH FOODS MOOTED IN JAPAN**

The increasing awareness for health in Japan has led in recent years to the explosive growth of natural health foods. The quality conscious Japanese have felt the need for strict voluntary standards for their health foods.

The standards for six types of health foods have recently been worked out by Japan Health Food Association. These are processed foods prepared from dried pulverized soft foods prepared from dried pulverized soft shell turtles, alfalfa, zirania latifolia Turczaninow (Wild Rice), Acanthopanax senticosus (Ruprecht et Maximoviez), Harms (Prickly shrub of Araliceae family) and Granoderma lucidum Fr. Kavsi (certain kind of mushroom) containing linolenic acid.

The above Association has begun in March 1986 a programme to examine relevant health foods and issue certificates for those meeting the standards. It started in 1986 to prepare voluntary standards for healthy foods in the Japanese market.

It has already established standards for 32 types of health foods

including the above mentioned six food items. These standards are confined to health foods produced from lunk-bud oil of wheat, natural Vit. E containing plant oil, chlorella, soyabean lecithin, oligosaccharide and proteins of plant and animal origin etc. These cover almost all the health foods on the domestic market of Japan. (*Japan Chem. Wk.*, 2/18/88, p. 4).

### **A SONIC FOOD DRYING SYSTEM ON THE HORIZON**

A sonic food-drying system developed by researchers at Purdue University and sponsored by US Development Corporation, Indianapolis, is being installed in a plant in Desert Hot Springs, California. The process being scaled up to commercial size is expected to be on-line by the middle of 1988, with one line for contact drying and another for large scale development work.

The system uses sources and heat to blast air past the material to be dried. The result reports Jan S. Marks, associate professor in Purdue's Food Science Department, is that product temperatures that use relatively low drying times are up to 4 to 10 times faster than with conventional methods. Marks reports that pilot units have been able to dry heat-sensitive products that conventional systems cannot handle, such as orange juice and high fructose corn syrup (HFCS). This new technology is expected in future to even benefit processors of hazardous wastes, drugs and chemicals (*C & EN*, 1/18/88, p. 21).

### **XANTHAN REPLACES GUAR GUM TRAGACANTH IN FOOD AND PHARMACEUTICAL FORMULATIONS IN USA**

The man-made xanthan gum made from sugar by fermentations is

rapidly replacing gum guar and tragacanth in food and pharmaceutical formulations. Xanthan is an unusual polysaccharide polymer produced by bacteria *Xanthomonas campestris*. In USA today xanthan is the most accepted and available semi-natural gum on the market.

Xanthan has a unique set of properties which are always sought after in food and pharmaceutical industries. It is stable at rest, it shakes well, it pours freely, it is fairly tolerant of high heat and does not lose consistency in the presence of dissolved salts. Further, xanthan is much more cost effective and cleaner than tragacanth.

Because of these advantages the food and pharmaceutical industries have taken to xanthan gums in a big way. As many as 4 to 5 companies are producing xanthan gum. These are Rhone Poulenc, Inc., Miles Laboratories, Kelco, Pfizer and Donald Combs of Sanofi Bio-Ingredients. (*CMR*, 5/2/88, p. 38).

### **RESEARCHERS DEVELOP A SHAMPOO FROM WASTE FISH FAT**

In Estonia (USSR) an experimental enterprise is turning out 1,000 tonnes a year of a shampoo called Merevant (meaning sea foam) from waste fish fat, using a new technique developed jointly by researchers at the Estonian Academy of Science and members of the Kirov Fishing Corporation.

The first stage of the process involves producing methyl esters of unsaturated fatty acids from the fish fat. This provides a raw material from which a variety of cleaning agents can be made. The wastes from the process can be burnt in thermal power stations. (*New Science*, 4/21/88, p. 36).



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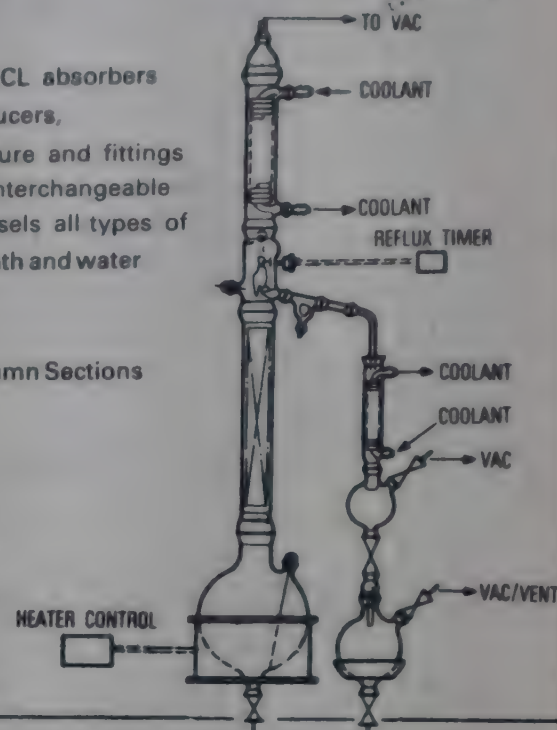
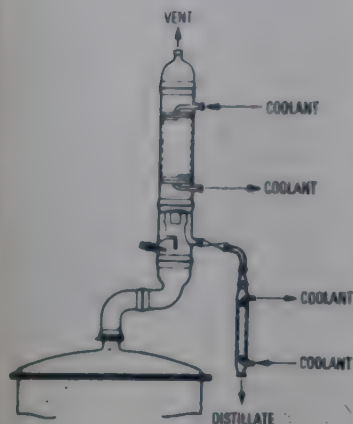
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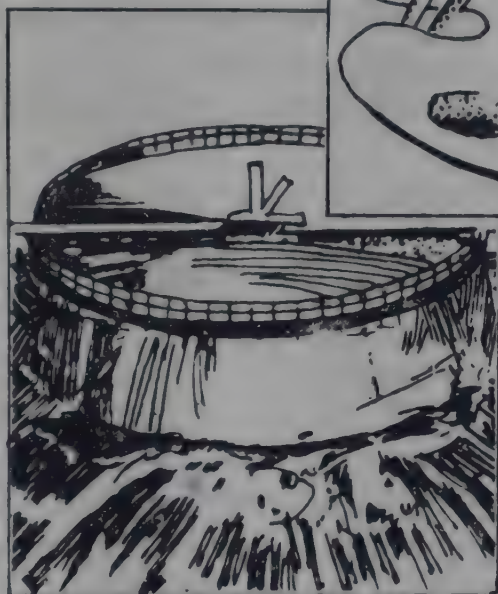
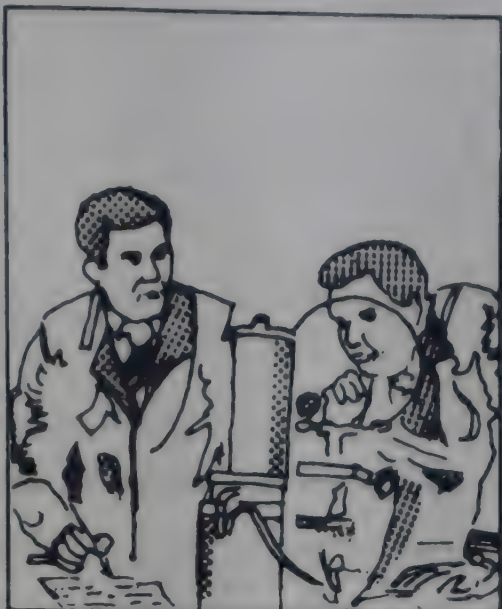
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## Chemical News from Abroad

### DOW TO ABANDON CFCs FOR SAFER SUBSTITUTES

Dow Chemical has joined the ranks of US and European companies publicly announcing plans to eliminate consumption of ozone depleting chlorofluorocarbons (CFC).

The company's main application of CFCs is as blowing agents for packaging and insulating foam, including Dow's Styrofoam building insulation material. Dow products containing CFCs comprised less than 6 per cent of total sales of \$13.4bn in 1987.

The company says it will phase out the use of fully halogenated CFCs in all its products as effective alternative compounds, which are safe and can be produced commercially, become available. Scientists at Dow have been working on such products for several years. A total of \$6m has been spent so far. In addition to internal research Dow has been cooperating with CFC producers and other users. The company does not manufacture the products itself.

Conversion to an alternative blowing agent for Styrofoam should begin over the next 18 months at all Dow's facilities. The change will take 2-3 years depending on the availability of alternative materials in the countries in which it operates and the time it takes to comply with local legislation.

The alternative, which has not been identified, is a non-fully halogenated CFC. Trade associations in the US have suggested that alternative blowing agents will be significantly more expensive than the CFCs currently be-

ing used, mooted figures of between 200 and 300 per cent. A Dow spokesperson on CFCs says that the cost of substitutes is extremely difficult to predict accurately.

Dow fully endorses the United Nations environmental programme's (Unep) protocol reached last year in Montreal, and the US environmental protection agency's proposed regulations regarding CFCs. The company adds that countries should accelerate their ratification of the Montreal treaty. Dow argues that stratospheric ozone depletion is a global issue and all nations must act together to resolve it.

The company also supports the EPA's recommendation that Unep

should reconvene after the Nasa ozone trends panel has released its final report, in order to draw upon international response to the evidence.

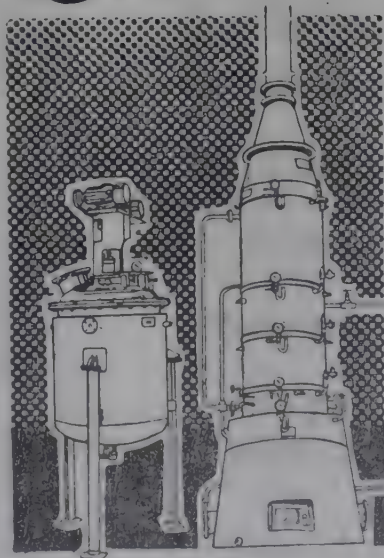
### YORKSHIRE SETS UP US BUSINESS

US speciality chemicals and dyestuffs manufacturer Yorkshire Chemicals has made its first acquisition in the US and is setting up Yorkshire Americas Inc as part of its aim to establish a chemical manufacturing business there.

The UK firm is paying a maximum of \$4.5 for Nachem Inc, a Massachusetts based concern specializing in the sale and distribution of speciality chemicals.

According to Terry Smith, financial director, the company sees

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considerable potential for speciality chemicals in the US, focusing particularly on those niche areas in which Yorkshire Chemicals already operates such as phenolic sulphones.

US sales at Yorkshire Chemicals are predicted to be around £20m (\$37m) by the mid 1990s.

Nachem reported pretax profit of \$815,000 on sales of \$11m of its last financial year. Sales of Yorkshire Chemicals totalled £49m while pretax profit reached £6m.

#### DYNAMIT NOBEL BUY

Feldmuehle Nobel, parent company of Dynamit Nobel, has announced plans to purchase Menzolit, a manufacturer and processor of glass fibre reinforced thermosetting plastics.

The acquisition of Menzolit, which had sales of DM141m

(\$83.5m) in 1987, is intended to strengthen the domestic and foreign sales and development capacities of Dynamit Nobel. The deal requires approval from the West German federal cartel office.

Last year, West Germany's Huls acquired most of Dynamit Nobel's chemicals and plastics operations. The deal did not, however, include the company's plastic moulding operations.

#### NOVO NEAR TO SALE OF FINE CHEMICALS

Denmark's Novo Industri is "very close" to concluding an agreement for the sale of the fine chemicals business it inherited when it acquired drugs concern Ferrosan in 1986. A spokesman said only board approval is required from the unnamed purchaser to enable the deal to go

ahead. The business has sales of Dkr40m (\$6m).

The divestment is part of a major shakeout being implemented at Ferrosan. The vitamins business Danchem is being sold to management with Novo retaining a 19 per cent stake. Novo's research activities into central nervous system disorders are to be strengthened through joint collaboration with Ferrosan. Novo said it expects to have products on the market — worth several billion dollars and growing — by the mid 1990s. Further changes are also under way in the pharmaceuticals sector with the transfer of Ferrosan's ethical drugs business to Novo.

#### NORDFASER FUTURE REMAINS UNCERTAIN

The West German cartel office's decision to block ICI's purchase of Nordfaser because it would give ICI too great a share of the German nylon fibres market has been slammed by the fibres industry association, Cirfs.

The association's president Professor Jean-Louis Juvet said that the deal would have been acceptable if it had been presented to the authorities in Brussels and the takeover should have been considered in a European, rather than German, context.

Sources have suggested that Nordfaser's best chance of survival lies with ICI. The German firm — currently owned by Veba Oil — is said to have developed advanced technology for fibres extrusion but its marketing strategy lacks strength. Backing from ICI's huge network would secure the business' future.

In response to reports that the two companies were still in talks, ICI said it is discussing commercial matters of common interest with Nordfaser.

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## Chemical Markets Abroad

### LAPORTE HITS ACQUISITIONS TRAIL AGAIN WITH UK DEAL

Laporte, the UK-based specialty chemicals group, is pressing ahead with its acquisitions programme. Its latest purchase of Gramos Chemicals International Ltd. for £14.4m (\$27m) further expands the company's UK specialities base.

Gramos, with annual sales of around £7m and net cash of £6m, supplies formulated chemicals and supporting products and services for cleaning, maintenance and environmental applications to a range of industries. It has three manufacturing bases in the UK and further operations in the Netherlands, France and W. Germany.

Laporte chief executive Ken Minton said the acquisition offered excellent prospects for expansion, particularly in Europe and the US. It is a new area of operation for the company and, according to Minton, "won't just be left," suggesting further purchases in the sector are on the cards.

The Gramos takeover marks Laporte's sixth acquisition for a total outlay of around £30m already this year. But Minton maintains that his firm's strong cash flow and lack of gearing means it is well placed to continue with its expansion programme. The Laporte stable has a number of "good quality race horses that all require watering and feeding," he added graphically.

### DOW IN MDI DEAL

Dow Chemical has taken full control of Isopor, the Estarreja, Portugal-based methane diisocya-

nate (MDI) producer, with the acquisition of Quimigal's 26 per cent stake. Terms of the deal were not disclosed but Dow says that the \$30m investment earmarked for Isopor does not include the price of Quimigal's stake.

Isopor was established in 1982 and has MDI capacity of 50,000 ton/year. Planned investments at Estarreja include a new syngas unit to boost MDI production and reduce energy costs, and environmental and safety improvements costing around \$7m.

Quimigal will continue to supply Isopor with anilines for MDI production.

### SIMON SELLS TR INTERNATIONAL

Simon Engineering, the UK contracting and services group, is to sell its chemicals distribution and trading operation TR International (Chemicals) Ltd. The business is being acquired by Amalgamated Metal Corp (AMC) for £5.3m (\$10m) with completion expected by the end of next month.

According to Simon, the TR businesses were no longer seen as a core activity for the company. Proceeds from the sale will go towards reducing borrowings.

AMC said that it had identified chemicals distribution and trading as a growth area for the group. It is already involved in chemicals trading in the UK and has both trading and distribution activities in the US and Canada.

Total sales in the sector amount to around £29m. A spokesman at AMC said there was a lot of "synergistic fitting to be done" and there were "a few changes" to be made at TR. It is

not known if job losses are involved.

Last year, the distribution company lost a major contract to Brenntag estimated to be worth around £10m. A number of employees also left TR to join the West German rival operation.

Separately, AMC has acquired Magnolia Chemicals and Solvent of the US for \$6.5m. The Louisiana-based company specializes in liquid solvents and will operate under AMC's Cron Chemical which distributes mainly cry chemicals in the southern states.

### AIR PRODUCTS LINKS WITH AKZO

Hard on the heels of BOC and Dow Chemical's announcement of the formation of a joint venture in the non-cryogenic air separation field comes news of a similar link up.

Air Products and Chemicals of the US and the Dutch chemicals concern Akzo have entered into an agreement to jointly develop membranes for air separation. Research & development will be conducted by both companies at their facilities. Any membrane products resulting from the deal will be supplied exclusively to Air Products.

Air Products believes a significant part of the industrial gases market can be served by non-cryogenic air separation systems. It has allocated a "large chunk" of its total 1988 R&D budget of \$68m to membrane development.

The Air Products/Akzo link marks the third trans-Atlantic gas separation deal to be announced this year. As well as the BOC/Dow agreement, Air Liquide and Du Pont have set up a joint venture for gas separation systems based on polymeric membrane technology.



## JAPANESE PE PRODUCERS RESTART MOTHBALLED UNITS

Around 120,000 ton of mothballed ldPE and lldPE capacity is due to be restarted in Japan this year following the lifting of the temporary measures law by the country's trade and industry ministry, Miti.

In addition, some unconfirmed restarts coupled with capacity expansions could bring the total to 270,000 ton by the end of next year. The move follows the Miti lifting of temporary measures on ethylene which is expected to add around 300,000 ton to ethylene capacity by the summer.

The latest figures from the Japanese petrochemical association show that ldPE and lldPE production is currently running at around 94 per cent of capacity. LdPE/llldPE output in Japan totalled 1.177m ton in 1987 against an estimated total capacity of 1.248m ton. Production of ldPE/llldPE was 327,700 ton for the

first three months of 1988 almost 10 per cent ahead of the year earlier period and the increased capacity should go some way towards meeting buoyant demand.

At the end of June, Asahi Chemical will bring 7,300 ton of mothballed ldPE capacity back on stream at Mizushima. Three companies will be restarting ldPE units on July 1: Nippon Unicar with 8,000 ton at Kawasaki; Tosoh with 23,500 ton at Yokkaichi; and Ube Industries with 24,000 ton at Goi. Showa Denko is to restart 13,000 ton of ldPE capacity at Unita in August.

As for lldPE, Nippon Unicar is bringing 20,000 ton on stream at Kawasaki in September and the Ube Industries is scheduled to bring a 50,000 ton unit on stream next October. Mitsubishi Chemical and Mitsubishi Petrochemical are also believed to be considering ldPE and lldPE restarts although these have not yet been confirmed.

Further capacity increases are expected in other ethylene derivatives later this year with Miti expected to lift similar regulations on hdPE, styrene and PVC.

## POTASH FIRM UP FOR SALE

Members of Canpotex, the Canadian potash export agency, are awaiting the sale of breakaway firm Saskterra owned by Calgary-based oil and gas producer Canterra Energy. The company is anxious to shed its fertilizer interests to allow it to concentrate on hydrocarbon production.

Saskterra which contributes only 4 per cent of the province's potash output, is the only Canadian producer not a member of Canpotex. The company withdrew its membership in January this year and has since been selling on the world market at prices below those offered Canpotex.

Robert Ford, vice president of the agency said that Saskterra elected to withdraw at a time

LdPE/llldPE capacity in Japan

Company	Present capacity		Restart/ new capacity		Start-up date
	(000 ton)		(000) ton)		
	ldPE	lldPE	ldPE	lldPE	
Asahi Chemical	96		7.3		Jun 88
Idemitsu		38.5			
Mitsubishi Chemical	58		35		Not confirmed
Mitsubishi Petrochemical	110	75	40	25	
Mitsui	127	45			Not confirmed
Nippon Unicar	119	28	8	20	
Nisseki	71	20			Jul 88/Sept 88
Showa Denko	70	20	18		
Sumitomo	142	25			Aug 88
Tosoh	79.5	23.5	23.5/19.5		
Ube Industries	81	20	24	50	July 88/Aug 88
					July 88/Oct 89
Total		1,248.5		270.3	



when there was strong demand worldwide so the international market has been able to absorb its product at a reduced price without forcing Canpotex to lower its levels. Ford indicates that other agency producers are hoping Saskterra will be purchased by an existing member, or one willing to join, to end Saskterra's "unsettling influence" in the potash market.

Canterra Energy has not revealed a purchase price for its subsidiary and no bidders have yet been publicly identified.

#### KOREAN PP STARTUP HEIGHTENS OLEFIN DEFICIT

The startup of South Korea's latest polyolefins unit, a 77,000 ton/year polypropylene plant, by the Honam Oil Refinery Company at Yochon City, looks set to increase the country's strained olefins deficit.

The new plant, built using the Union Carbide/Shell Oil Unipol process was finally brought on stream earlier this year after considerable delay, but sources say the plant is running below capacity because of a shortfall in propylene supply. Honam Oil has a name-plate capacity of 80,000 ton of propylene at Yochon but was 30,000 ton in deficit last year.

Last year, Korea had an overall propylene deficit estimated at some 230,000 ton, and sources believe it could top 350,000 ton by the end of 1988. The shortfall is likely to intensify later this year with an 80,000 ton PP plant due on stream at Yukong's site in Ulsan.

ply has helped push up propylene prices into Korea. Product from Japan, which supplies around 150,000 ton/year of Korea's deficit is currently moving at around \$460-480/ton c&f Korea, although prompt spot from Libya is now commanding \$550-560/ton c&f.

However, Korean producers hope the supply picture will ease later this year when Honam Ethylene completes a 250,000 ton ethylene cracker expansion at Yochon which will improve propylene supply to Honam's PP unit. Yukong is also due to start up a 400,000 ton/year ethylene cracker at Ulsan next year which will provide propylene for its PP unit, but again, this comes on stream some time after the PP unit is due to start up.

In the long term observers believe the Korean olefins balance should begin to right itself by 1990 when the Yukong unit is in production, and could move to surplus by 1992 when Lucky's 350,000 ton/year cracker comes on stream at Yochon. Honam Petrochemical recently approved plans for another 80,000 ton/year PP unit at Yochon which will use propylene from the plant.

In the short term, however, the Koreans look set to face a continued supply problem on olefins which will keep derivative units running below capacity and force users to continue paying high prices for imported feedstock.

#### CANADA'S OUTPUT AHEAD IN '87

Canada's petrochemical industry recorded "significant gains" in production during 1987 according to official statistics. Produc-

tion of ethylene rose by 12.1 per cent on the previous year to 2.1m ton with plants reported operating at over nameplate capacity.

Propylene output, however, remained flat despite strong demand. The main reason cited was Petromont's conversion of its cracker at Variennes near Montreal to run on propane, effectively eliminating C<sub>3</sub> output from the unit. The plant had a capacity of 95,000 ton/year of propylene based on naphtha feedstock.

Benzene output rose strongly by 13.2 per cent to 7.2m ton. The increase was attributed to strong demand by styrene producers and the increasing trend of integrated oil refiners to divert more aromatics to the unleaded gasoline pool. Methanol production jumped 16 per cent to 2.6m ton.

Exports increased by around 6 per cent to 3.2m ton. The biggest jump recorded was for butylene which leapt 61 per cent to 73,000 ton, largely as a result of higher demand for butene-1 copolymer in lldPE production.

#### GLAXO INVESTS AT GERMAN SITE

The UK pharmaceutical major, Glaxo, is investing DM40m (\$23.8m) in the expansion of its German plant at Oldesloe. Construction has started on drugs production facilities, and development facilities to house trials for existing and future products are also being built. A Glaxo spokesman said that the investment was part of a natural expansion of one of its major pharmaceutical markets. The new laboratory is scheduled to start operations in mid-1989.



## In the European Market

Naphtha prices have remained steady at \$162-167 ton cif, underpinned by demand throughout NWE and the Med.

Ethylene trading in NWE is still on hold with no deepsea material available and prices are unchanged at \$460-480/ton cif. However, the AIG pipeline remains extremely congested and spot numbers are now touching DM 1,000/ton delivered. The first Q2 ethylene contract has been settled between ROW and Hoechst. A figure has not been revealed but sources say the price is close to DM825/ton delivered.

Propylene availability remains tight, but spot business has been thin leaving prices steady around DM620-640/ton cif NWE.

Butadiene prices are still firming on both sides of the Atlan-

tic, driven partly by the US supply shortfall caused by the Shell Norco explosion. Traders report that US demand is very strong although this has yet to be reflected in spot export business out of Europe. Deals have been done to the Far East around \$330/ton fob but prices are now being talked in the range \$350-360/ton fcb.

There is plenty of benzene in Europe and prices have dropped to \$305-315/ton. Exxon has restarted its 850,000 ton/year aromatics unit at Botlek in The Netherlands and traders are predicting that this excess product will dampen the market. While large customers are reported to be paying \$300/ton for product, a handful of 1,000 ton deals were concluded at \$310/ton and \$312/ton for May and June delivery.

While the bottom end of the toluene range in Europe has drifted down to \$255-265/ton, US levels have surprised the market by remaining relatively firm. The price hiccup following the Norco explosion, which some traders believed would be shortlived, has kept prices at 83-84 cents/gallon.

With little prompt interest in paraxylene, prices have fallen to \$590-600/ton. Bombay Dyeing and IPCL are still in the market although Korea has now satisfied its needs. Rumania is said to have put out feelers for 2,000 ton in Europe. Koch Chemical's 210,000 ton/year unit at Corpus Christi in the US is understood to have closed for around 2 months following technical problems and the company has placed its customers on 75 per cent allocation. The knock-on effect of this on the market has not yet been felt.

Orthoxylene trading has been dull with sellers holding out for \$330/ton but prepared to concede \$325/ton for May delivery. Bidders are looking for numbers nearer \$320/ton however.

Styrene prices have continued to astound the market with another major jump of over \$100/ton recorded this week. T2 prices now stand at \$1925-1975/ton and T1 at \$1,500-1,950/ton. The same major producers and end consumers are still hunting for product but with only 3,000 ton estimated in Rotterdam, some traders say \$2,000/ton is just around the corner while others, more cautious, say it is becoming "too hot to handle". Meanwhile the shortage of ethylene on both sides of the Atlantic has lifted ethylbenzene prices from \$1,100-1,150/ton to offers of \$2,000



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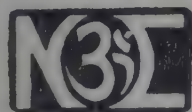
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## Biotechnology

### UPJOHN IN DEAL TO MARKET BEECHAM HEART DRUG IN U.S.

Beecham group has enlisted the help of Upjohn, the US pharmaceuticals company, to sell its heart attack drug **Eminase** in the US once it obtains government approval.

The new treatment, which dissolves blood clots blocking arteries to the heart, is set to challenge **Activase**, the rival drug developed by the US group Genentech. Unlike **Activase** the Beecham product has yet to be approved for sale by the US food and drug administration. But the marketing agreement with Upjohn should help ensure the drug is on sale in the US by mid-1989.

**Eminase** is already on sale in West Germany and Belgium, and Beecham plans to apply for marketing approval in the UK in the near future.

Under the deal Beecham and Upjohn will jointly market the drug in the US under the **Eminase** brand name while Beecham retains responsibility for manufacture and distribution. Upjohn has a large sales force with links in US hospitals and good geographical spread. The Beecham drug faces tough competition from its established rival Genentech and Wellcome should also be launching a new drug on to the market soon. But **Eminase** may be sold at a lower price than its rival as it is in West Germany. Analysts are estimating that US **Eminase** sales will be around \$100m to \$150m by 1992 with worldwide sales approaching \$400m.

The Beecham drug is a plasminogen streptokinase complex and differs from the other blood clot

treatments which are tissue plasminogen activators (tpa). One of its advantages over tpa drugs is that **Eminase** can be given as a five minute single injection instead of an intravenous drip lasting several hours. This means that it could be administered by ambulance crew.

A recent study in the UK medical journal **Lancet** found that **Eminase** halved the death rate of heart attack victims who were injected within six hours of the onset of symptoms.

### SCHERING SEEKS DRUG APPROVAL

West German pharmaceuticals and agrochemicals manufacturer Schering has applied to Brussels for the registration of its new prostacycline drug **Iloprost**.

The company says it is taking advantage of a new EEC rule which allows high tech products to be approved for use in all 12 member countries simultaneously. The move will enable the West Berlin-based firm to bypass registration with the German federal health authority (Bundesgesundheitsamt) where waiting times can be more than two years.

**Iloprost** is only produced in small quantities at an experimental plant at present. However, Schering plans to spend between DM70-80m on a new facility in West Berlin.

Schering says it sees excellent chances for the new drug and annual sales could be as high as DM400m (\$238m). The product is currently recommended for the treatment of circulatory problems resulting from arteriosclerosis.

Clinical trials for cardiovascular illnesses and for the preparation of kidneys for transplant are

also under way. Currently available only as an injection solution, the drug should be available in oral form within two years, the company said.

### ISRAELI BIOTECH FIRM FOLDS

Despite overseas sales growth of 50 per cent year, Israel's ten year old biotechnology industry has seen its first casualty. Pharmadam Development has ceased to operate.

According to sources, the six year old company began to show stress when it switched from developing human vaccines such as hepatitis B to focus on extraction technologies. The change was driven by the unreliability of government funds during Israel's inflation crisis of 1984.

Pharmadam had hoped to establish joint ventures to develop several aspects of hyaluronic acid technology. In 1987, the firm had contract research and sales worth \$500,000.

### URBK CONSTRUCTS SECOND DME UNIT

URBK, the West German dimethylether (DME) producer, has started construction of a second DME plant at Wesseling, which will be commissioned later this year.

The plant will give URBK a total capacity of 60,000 ton/year, which the company believes will be sufficient to meet growing demand in Western Europe.

Recently, DME has found increasing demand as a replacement for ozone-depleting chlorofluorocarbons in the high purity aerosol propellant applications. The company is now marketing aerosol grade product in its own name, as well as selling it to chemical companies active in propellants.



## ANAMID EXPANDS UK RESEARCH CENTRE

American Cyanamid's UK subsidiary is spending £9m (\$17m) on new research facilities at its Gosport, Hampshire site. The centre will replace and expand existing laboratories and include a synthesis pilot plant. Construction of the centre is expected to take 18 months to complete.

Although a significant increase in research staff is not expected to result immediately, space has been made for additional personnel who, the company says, will be needed to meet long term growth plans.

Cynamid's pharmaceutical company Lederle, a key player in the development of anti-cancer products, will continue its work in this area at the new laboratories. The joint venture with Celtech for the development of monoclonal antibodies will also be carried out at the Gosport site.

Cynamid (UK), which specializes in applying biotechnology to product and process development, serves the medical, agri-

cultural and animal health industries.

## MONSANTO FIELD TESTS GENE-SPLICED CROP

Monsanto Canada has started smallscale field tests of rapeseed which has been genetically engineered to tolerate the company's Roundup herbicide.

Testing is being conducted on a large grain farm in Wheatland County, Alberta. Engineered and control (non engineered) rapeseed has been planted and the crops will be studied through the summer to compare how they perform during a typical growing season.

Monsanto claims tolerance to its herbicide has the potential to significantly reduce the cost of growing rapeseed, as weeds such as wild mustard and stinkweed can be more efficiently controlled. Although potential commercial products are still several years away, the company believes the genetically engineered plants could eventually save Canadian growers millions of dollars in weed control costs.

## ECCOGEN IN BIOPESTICIDE LINK WITH ENICHEM

Ecogen, the US firm specializing in biological pest control, and Enichem SpA have entered into a worldwide licensing agreement covering insect resistant corn, sunflowers and potatoes which will contain Ecogen's biopesticide genes from the *Bacillus thuringiensis*. Under the agreement, Ecogen will supply two genes which produce proteins effective against caterpillar and beetle pests and Enichem will incorporate them into the economically important crops. Ecogen will receive an initial payment and royalties on sales of Enichem products containing the genes.

—Ecogen has also signed a research and development agreement with Enichem which calls for Ecogen to increase the performance of the genes and to identify and clone further genes which produce pesticides from the *Bacillus*.

Ecogen has just started large-scale field trials of a biopesticide which produce pesticides from the *Bacillus*. The insecticide is called Condor and is used to con-

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trol the caterpillars of gypsy moth and spruce budworm which defoliate forest trees. The bacteria produce a protein crystal and this acts as a stomach poison in the pests. Ecogen claims that the protein is not harmful to any other form of life.

"Since 1983 Ecogen has collected more than 5,000 strains of *Bacillus thuringiensis* with bio-pesticidal activity", said Dr. John McIntyre, Ecogen's vice president, commercial development.

#### FRENCH FIRMS IN FLUORINE VENTURE

French fluorine chemicals producer Comurhex has teamed up with Air Liquide to produce and sell gaseous fluorine compounds for use in the electronics and other high technology industries.

Initially, the companies have agreed to cooperate on tungsten

hexafluoride. Comurhex will produce and purify the gas at its existing plant located in Pierrelatte. By early 1989 Air Liquide's Alphagaz division will market the product worldwide.

#### EUROPE UNITES ON AIDS R&D

Europe has established a European federation for research on Aids. The federation, which has representatives from West Germany, France, Switzerland, Italy and the UK, hopes to attract financial support from major pharmaceutical firms.

It has set itself four research priorities: virology and the role of regulatory proteins in the HIV-1 Aids virus; DNA and research on the HIV-2 virus; mechanisms of infection; and clinical epidemiology.

Professor Luc Montagnier, one of the driving forces behind the new federation, has slammed the French government's Aids policy for being inconsistent. Montagnier is concerned that while international cooperation in Aids research is booming, the French government is less forthcoming with funds.

Last year the government provided FF100m (\$18.7m) for Aids research but so far this has only committed FF20m. This compares with US senate proposed spending this year on research and education of \$1.2bn. Montagnier claims that his own laboratory is already running out of funds.

#### BRISTOL-MYERS BREAKTHROUGH

Researchers at Bristol-Myers, the US drugs major, have developed a cheaper method to synthesize key Aids drugs intermediates. The scientists can now produce dideoxycytidine (DDC), dideoxyadenosine (DDA) and dideoxyinosine (DDI) from the less complex and cheaper raw material L-glutamic acid.

Conventional syntheses start from 2-deoxynucleosides via Barton-type deoxygenation reactions or from intact nucleosides by multistep routes involving deoxygenation and hydrogenation reactions.

The 2,3-dideoxynucleosides are all being investigated as potential Aids drugs, and could also have applications in combating other viruses.

#### CIPHARM BEGINS OPERATIONS

An Ivory coast project first mooted ten years ago is finally up and running. Rhone-Poulenc linked with Roussel-Uclaf and Sanofi to set up a pharmaceuti-

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als joint venture in Abidjan. The new company, Cipharm, manufactures a range of products previously imported from France.

Rhone-Poulenc has a 26 per cent stake in the FF36m (\$6.3m) unit. Elf Aquitaine's drugs subsidiary Sanofi and Hoechst's Roussel Uclaf each have 13 per cent with the balance held by local investors.

Products manufactured by Cipharm include the anti-malarial drugs of all three partners. Sales in 1988 are expected to reach around FF25m.

### DU PONT STARTS NYLON 12/12 UNIT

Du Pont Canada has completed the first production run of nylon 12/12 at its Maitland, Ontario facility. The company says the material represents a new generation of engineering resin, and estimates that there will be an increase in customer demand for the polymer.

Nylon 12/12 is resistant to chemicals and hydrolysis and is flexible in cold temperatures. End uses listed by the company in-

clude car fuel system components, cable jacketing and powder coating.

The polymer is made by reacting 1,12 dodecanediamine and 1,12 dodecanedioic acid. The acid is available from Du Pont's Victoria, Texas facility. The company's Canadian subsidiary has the capability to convert the acid to the diamine on both existing and modified facilities in Maitland. However, a company spokesman said a new plant may be built at Maitland. The diamine and dioic acid are polymerized in Kingston and compounded in Maitland. Polymerization capability in Chattanooga, Tennessee is also available and is being utilized.

The company believes it will have enough capacity to meet customer demand over the next ten years, and estimates future demand to be about 23,000 ton/year.

The nylon 12/12 venture is a result of cooperation between Du Pont Canada and the polymer products, automotive products and petrochemicals division of the US parent.

### USSR AWARDS CATALYSTS PLANTS

The Soviet Union has awarded contracts to build two catalyst production plants at the Ishimbai complex in the southern Urals region. The main contract went to a Japanese consortium comprising C.Itoh and JGC and covers the construction of a plant to produce 20,000 ton/year of FCC catalysts based on technology licensed by CCIC.

A DKr 200m (\$30.8m) contract for a 3,000 ton/year plant to produce hydrotreating and hydrocracking catalysts has been won by Denmark's Haldor Topsoe.

The company will supply know-how, equipment for upgrading of raw materials and for the production of catalysts as well as related test laboratories. It will also supply a research laboratory.

The contract also covers a research agreement between Haldor Topsoe and relevant Soviet institutes.

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## News About New Projects

### USSR IN MASSIVE PETCHEM, FERTILIZER JV PROJECTS

At a time when partners in Tenghiz-polymer are immersed in a feasibility study into their \$6bn petrochemical joint venture, the biggest proposed East/West venture yet, news is emerging of five new massive petrochemical and fertilizer complexes which the Soviet Union would like to develop by the end of the century.

News of the proposed projects, which the Soviets would like to develop as joint-venture partnerships, began to unfold during the US-Soviet joint commercial commission in Moscow last month. Details are still sketchy however, particularly as foreign trade organizations, such as Techmashimport, are not involved and the projects are to be handled directly by the individual ministries concerned.

However ECN understands, that the USSR would like to see involvement by US firms in four of the schemes whilst the fifth project, because of its proximity to Japan, would be developed

with the help of Japanese companies.

Because of the vast size of the proposed complexes, consortia of similar magnitude to the Eni-chem / Montedison/Oxy/Marubeni Tenghiz-polymer group would undoubtedly need to be formed. Engineering contractors could find a role as co-ordinators as well as suppliers of plants.

In line with its declared policy of locating production plants closer to raw material resources, four of the projects are destined to be sited in Siberia, near the USSR's main oil and gas reserves.

The fifth, in the Far East of the USSR, would be fed on natural gas from Sakhalin island. The oil processing and petrochemicals ministry, under minister Nikolai Lemayev, is pursuing two of the schemes. The larger, and by far the most ambitious of the five, will be located near Surgut.

Three phases of implementation are proposed, starting in 1990-1996; 1996-1998 and, finally, 1998-2000.

The Surgut venture will include capacities for 1.5m ton/year of the octane booster methyl tertiary butyl ether (MTBE). In addition plans call for 1.2m ton/year methanol, 2m ton/year of benzene hydrocarbons and 150,000 ton/year of synthetic oils.

A mammoth 1m ton/year of styrene monomer and 500,000 ton/year of polystyrene units are proposed for Surgut, along with 480,000 ton/year of phenol, 300,000 ton/year of acetone, 200,000 ton/year of higher synthetic alcohols, 70,000 ton/year of synthetic fatty acids and 130,000 ton/year of oil additives.

The second project to be handled by the same ministry will be sited near the existing Tobolsk petrochemical complex. It will become the country's major synthetic rubber producer and include plants for 360,000 ton/year of general purpose rubbers, 975,000 ton/year of special purpose rubbers including 210,000 ton/year of butyl rubber and 120,000 ton/year of Santoprene (this is a Monsanto-process thermoplastic elastomer containing polypropylene and EPDM), 300,000 ton/year of other thermoplastic elas-

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omers, 80,000 ton/year of urethane elastomers, 300,000 ton/year of styrene monomer and 300,000 ton/year of MTBE.

Ambitious plans are also being developed by the ministry of the chemical industry under minister Yuri Besspalov. In the Tomsk region there are proposals to build units for 300,000 ton/year of ethylene, 300,000 ton/year of styrene, 240,000 ton/year of formalin, 200,000 ton/year of polyethylene, 100,000 ton/year of polyformaldehyde, 10,000 ton/year of polystyrene, 40,000 ton/year of polyphenylene oxide, 20,000 ton/year of polybutylene terephthalate, 30,000 ton/year of other plastics and 100,000 ton/year of composites.

The complex based on, Sakhalin gas also under the same ministry, could in part be located on the mainland. It could comprise a 300,000 ton/year ethylene cracker with downstream units for 100,000 ton/year hdPE, 200,000 ton/year ldPE, 50,000 ton/year of PP and a number of engineering plastics.

The fifth complex would be majority owned by the ministry of fertilizer production, headed by minister Nikolai Olshanskii. It would be based near Tyumen and include plants for 1.425m ton/year of ammonia and 1.5m ton/year of fertilizers (such as urea, ammonium nitrate and ammonium sulphate), 80,000 ton/year of caprolactam, 10,000 ton/year of pesticides and 200,000 ton/year of sulphuric acid. Units for the production of melamine, nylon 66 and nylon 12, plus raw materials, are also planned.

The projects are at a very preliminary stage and it is understood that no discussions with potential partners have yet taken place. Indeed it is uncertain whether or not there would be sufficient interest by Western companies to see the projects through to fruition as joint ventures.

The Soviet internal market is huge but at least half the output from major chemical ventures with foreign partners is normally

expected to be sold in the West. Industry sources observe that the massive quantities under discussion could push Western markets into oversupply.

The Soviet Union has identified a number of companies it wishes to talk to on the projects. For the Surgut complex, these include: McDermott, Combustion Engineering and Union Oil Products of the US; Mitsui and Toyo Engineering of Japan; Lurgi and Linde of West Germany; and Eni of Italy.

Companies targeted for the Tobolsk venture include: McDermott, Combustion Engineering, Du Pont and Monsanto of the US; Mitsui, Toyo and Mitsubishi of Japan; Montedison, Pressindustria and Eni of Italy.

For Tomsk the list includes: Du Pont, Monsanto and General Electric of the US; Salzgitter and Hoechst of West Germany; and Mitsui and Toyo of Japan.

Finally, for Tyumen, target companies include: Monsanto, Du Pont, Cargill and General Electric of the US, Mitsui, Maru-

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beni, Toyo and Mitsubishi of Japan; Hoechst, Lurgi and its parent, Metallgesellschaft, Salzgitter and BASF of West Germany; ICI and Humphreys & Glasgow of the UK; and Stamicarbon of the Netherlands.

It has been estimated that from the year 2000, the value of exports will reach Roubles 1bn/year from Surgut, Roubles 1bn/year from Tobolsk, Roubles 300m/year from Tomsk, and over Roubles 100m/year from Tyumen. The fertilizer complex would make about a third of its output available for export.

#### **LURGI/LITWIN SIGN TENGHIZ SOUR GAS CONTRACT**

Lurgi has confirmed that a consortium of its French subsidiary Lurgi SA and Litwin of France

has won the order to supply gas and oil treatment facilities for Tenghiz II and Tenghiz III near the Caspian Sea.

First revealed in ECN May 9, the DM500m (\$296.2m) contract was awarded on May 13 by the foreign trade organization Machinimport on behalf of the Soviet ministry of oil production.

The award covers the engineering, supply of technical documentation and equipment, as for two process units to produce well as supervision of erection 3m ton/year of stabilized crude each.

The accompanying gases will be desulphurized to recover 450,000 ton/year of pure sulphur per unit. The gases will be separated into 175,000 ton/year of ethane, 100,000 ton/year of propane 200,000 ton/year of li-

quefied gas and 630,000 ton/year of natural gas.

Because of stricter environmental regulations in the USSR the new units will recover 99.9 per cent of sulphur using a new process (not Sulfureen) which is currently being developed by Lurgi. The exact quantity will depend on the H<sub>2</sub>S content in the gas. Final capacity of the three Tenghiz lines should be in the region of 1.5m ton/year of sulphur.

Around a quarter of the supplies and services for the new stages of the Tenghiz complex will come from West Germany. Supplies from the USSR have been significantly increased compared with the first stage, where construction is now under way and due for completion by the end of 1989.

Completion of the second and third stages of the complex is slated for 1990.

Companies including Lurgi, Lavalin and Mannesmann are still competing to supply the gas gathering system which will collect feed from all the well head streams and transport it to the processing plants.

The facilities will supply feed to the massive \$6bn petrochemical joint venture Tenghizpolymer, now under feasibility study by Enichem / Montedison / Marubeni / Occidental. In total over 10 such lines will need to be installed.

#### **HIMONT BUILDS PLANT AT FERRARA**

Himont Inc. the polypropylene subsidiary of Italy's Montedison, has announced plans to build a new plant at its Ferrara, Italy, fa-

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ity for the manufacture of a wide range of engineering resins and elastomers.

The 80,000 ton/year unit represents a diversification for Himont. The company said that production will concentrate on new materials not related to the Spheripol polypropylene technology. Completion is scheduled in the second half of 1989. A similar unit is planned in North America.

Although it declined to give details, Himont said that the new Catalloy technology, developed by the company at Ferrara, combines different monomers and different catalysts to produce innovative polymers and materials that are not currently made in plants based on the Spheripol process.

The products, tailor-made for clients' needs, offer a wide range of characteristics at low costs.

In announcing the plan Himont said that the project will open up major new markets for engineering resins and elastomers as well as supply existing ones. Himont foresees markets for these reaching 454,000 ton/year by 1992.

The Ferrara complex, described as the cradle of the polypropylene technology, developed in 1957 and later perfected with the introduction of the Spheripol process, has again been chosen for the development of the latest Catalloy process in order to capitalize on market research and technological support at the site.

Himont's present production at Ferrara covers polypropylene resins and composites as well as titanium and aluminium alkali catalysts.

## COLOMBIA INVITES BIDS FOR LLDPE UNIT

Colombia's state-owned oil company Ecopetrol plans to build a new linear low density polyethylene plant. The company has issued invitations to bid for a 60,000 ton/year plant it would like to set up in a joint venture partnership between its affiliate Policolsa and another investor.

Ecopetrol has confirmed that it is in touch with Dow, Union Carbide Corp, BASF and a Colombian company on the project planned at Barrancabermeja.

Policolsa, the country's existing producer of polyethylene, runs a 56,000 ton/year low density PE plant.

Ecopetrol says its ethane cracker, also at Barrancabermeja has enough capacity to feed the new facility.

Built by CTIP of Italy and KTI of the Netherlands in 1980, the ethylene plant has a capacity of 120,000 ton/year. Completion of the new lldPE unit is planned for 1990.

Meanwhile work on Colombia's world-scale polypropylene facility is under way for completion in the last quarter of 1989. The 120,000 ton/year plant is being built by Fluor Daniel for Petroquimica Colombiana. Union Carbide is supply Unipol PP technology for the Cartagena-based unit.

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# MARKET INFORMATION

## Gohsenol and styrene are up

Gohsenol GH 17 is in acute shortage and so the price has gone up to Rs. 125/- per kg. Cyclohexanone, MEK, DEG, and Styrene are in short

supply. Butyl Acrylate monomer has come down to Rs. 82/- per kg.

In dyes intermediate section MNA, Meta Unido Aniline, Tobias Acid and up.

Sulpho tobias Acid are in short supply and due to this prices have gone up. Dyes section is steady.

We cannot guarantee the accuracy of the prices published in CHEMICAL WEEKLY as they are based only on the enquiries made by our correspondent — and, as such they are not FIRM PRICES as between a buyer and seller. The prices are published only with a view to giving some ideas of market conditions.

The prices are inclusive of Excise and Maharashtra Sales Tax.

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Ammonium phosphate (Di)	12.00	Boric acid (Tech.)	21.00	Camphor (Indian)	82.00
Ammonium carbonate (Di)	17.00	Bisphenol-A	62+ST	Cresylic acid	50.00
Ammonium bicarbonate	4.75	Butyl carbitol	48.00	Cream of Tartar (Tech.)	70.00
Ammonium chloride	3.00	Caustic soda (Flakes)	9.20	Citric acid (Belgium) (Resale)	43.00
Ammonium nitrate	3.50	Caustic soda (Solid)	8.00	Citric acid (Indian) (Resale)	42.50
Arsenic white powder	21.00	Caustic soda (Lye)	7.00	Copper sulphate	17.50
Acrylamide (Resale)	57.00	Calcium chloride 70% (solid)	3.25	Chromic acid	48.00
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J. Acid Urea	275.00
K. Acid	100.00
MDPS (German)	200.00
MNA	85.00

Meta Unido Aniline	145.00
MPD (Local)	130 + Ex + Tax
MPD (Japan)	200.00
Naphthenic Acid	12.00
N-Methyl J. Acid	380.00
N-Methyl Aniline	16.00
Naphthalene (Refined)	22.00
Ortho Anisidine (OA Imp.)	12.50
Ortho Dichloro Benzene (ODCB)	15.00
OT Base	95.00
Para Dichloro Benzene (PDCB)	16.00
Para Anisidine (PA-Imp.)	110.00
Para Anisidine (PA-Local)	90.00
PNA	70.00
Para Cresidine (Imp.)	325.00
Para Amino Azo Benzene (India)	125.00
PNCB	30.00
Para Amino Acetanilide	145.00
1-Phenyl 3-methyl-5 Pyrazolone	120.00
Phenyl J. Acid	345.00
Para Amino Benzoic Acid	170.00
PT Base	88.00
Rhoduline Acid	500.00
Resist Salt	20.00
Resorcinol	145.00
Sodium Naphthionate	65.00
5-Sulpho-Anthranilic Acid	64.00
Sulphanilic Acid	25.00
Sulpho Tobias Acid	113.00
Trichloro Benzene (TCB)	17.00
Tobias Acid	120.00

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mercial Centre,  
Near Navjiwan Press,  
Ashram Road,  
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Phone : 409953

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(Prices as on 30th June, 1988)

<b>ACID COLOUR</b>	<b>Per Kg.</b>	Brill. Violet Extra	126.40	Scarlet RR	214.80
Acid Violet 4BS	143.00	Blue 2B	86.60	Rubine 3B	223.00
Acid Maroon V	110.00	Blue G	170.50	Rubine CB	364.90
Acid Orange II	77.80	Sky Blue FB	188.25	Blue GL	318.90
Acid Orange IIV	63.05	Copper Blue GR	147.00	Blue BGF	636.50
Acid Red A	107.25	Fast Greenish Blue GL	114.60	Navy Blue RF	270.40
Crosein Scarlet MOO	155.00	Developed Black BT	116.10	Brown 3REL	200.40
Acid Scarlet 3R	99.90	Blue NB-2B	300.20	Black GEL	324.20
Acid Red 3BN	135.00	Blue NB-2BC	185.30	Dark Brown 3B	317.40
Acid Red R2R	132.00	Developed Black NB-GHB	185.30		
Acid Red RS	88.00	Green B	111.65	<b>BASE COLOURS</b>	<b>Per Kg.</b>
Acid Green V	230.00	Green NB-B	188.25	Fast Yellow GC	80.20
Acid Patent Blue AS	250.00	Green 2B-N	188.25	Fast Orange GC	135.45
Acid Coomasi Blue	200.00	Brown MR	154.40	Fast Scarlet R	166.90
Acid Yellow 5GN	65.00	Brown CN	107.25	Fast Scarlet RC	126.65
Acid Red PG	85.00	Golden Brown G	140.35	Fast Scarlet RCR	99.05
Acid Red GRS	78.00	Catechin G	120.50	Fast Scarlet G	121.65
Acid Black 10 BX	121.95	Omega Tan	126.40	Fast Scarlet GN	91.50
Acid Black BX	98.40	Catechin GS	102.80	Fast Scarlet GG	72.70
Acid Black Wax	135.50	Black E Hly Conc.	142.60	Fast Scarlet GGS	72.75
Procinil Yellow GS (ICI, UK)	265.00	Black E Extra Hly. Conc.	142.60	Fast Red B	203.20
Procinil Red GS (ICI, UK)	530.00	Black NB-ER Hly. Cone.	310.50	Fast Red RC	119.15
Procinil Blue RS (ICI, UK)	315.00			Fast Red R Flakes	149.25
Procinil Scarlet G (ICI, UK)	600.00	<b>DISPERSOL COLOURS</b>	<b>Per Kg.</b>	Fast Red TR	166.80
Procinil Orange G (ICI, UK)	250.00	Yellow 6G Powder	143.80	Fast Red TR Oil	183.15
Procinil Rubine (ICI, UK)	550.00	Red B 3B Powder	247.80	Fast Red RL	237.10
		Red B 2B Powder	323.20	Fast Red KB Oil	201.90
		Red CB Powder	439.15	Fast Bordeaux GP	201.95
		Red D2B Powder	477.40	Fast Garnet GBC	94.00
		Violet C 4R	521.90	Fast Violet B	505.60
		Blue BG Powder	235.45	Fast Blue BB	521.40
		Blue BN Powder	103.75		
<b>DIRECT COLOURS</b>	<b>Per Kg.</b>	Blue D 2R Powder	476.25	<b>NAPHTHOL COLOURS</b>	<b>Per Kg.</b>
Yellow 3GX	88.10	Navy BT Powder	243.90	ASG	217.00
Gun Yellow RCH	124.00	Blue B 2G Powder	210.20	AS	143.00
Fast Yellow GCH	141.15	Black BT Powder	182.60	ASSW	279.75
Yellow CFG Hly. Conc.	312.00	Blue BR Powder	390.20	ABBS	189.15
Fast Yellow GS	111.65	Yellow 7GL	338.60	ASBO	195.65
Fast Yellow CHRS	95.45	Yellow 5RX	218.80	ASD	175.50
Viscose Orange A	166.15	Yellow 3G	367.25	ASOL	179.35
Fast Orange GR	133.75	Yellow	140.00	ASTR	279.75
Red	96.90	Yellow AL	135.30	ASPH	279.75
Dark Tan	78.25	Yellow Brown REL	247.50	ASE	196.05
Red IIR	72.55	Yellow FFL	463.60	ASEI	184.40
Red 4B	169.10	Gold Yellow GG	259.70	ASLB	1632.60
Bordeaux BW	132.30	Pink REL	247.00	ASBT	1817.00
Fast Scarlet 4BS	166.55	Red REL	468.65	ASWG	143.00
Red 12B	170.55	Red 2B	327.40	ASSG	397.70
Bordeaux Hly. Conc.	194.00	Red FB	324.20	ASSR	480.50
Cotton Red N	117.05	Red Violet FBL	469.85		
Brill. Fast Helio B	278.00	Orange 3R	196.65		
Brill. Fast Helio 2B	297.00	Violet 3R	280.00		
Brill. Fast Helio 2RS	136.20	Violet RL	275.45		
Brill. Fast Helio BS	116.10	Violet 6R	485.75		



COLOURS	Per Kg.				
<b>COLOURS</b>					
Golden Yellow HR	181.80	Navy Blue M 3R	310.95	Blue R Conc. Pdr. Fine	577.65
Brill. Yellow H4G	117.85	Brill. Blue MR	331.70	Blue RR Supra Powder	629.35
Supra Yellow H-8GP	168.55	Brill. Blue M RX	214.20	Blue Conc. Powder	645.80
Brill. Yellow HE6G	166.95	Brill. Blue M-G	382.30	Brill. Blue 2R Hly. Conc.	378.55
Yellow H-E4R	276.05	Blue M 4GD	344.60	Brill. Blue 2R Supra Disp.	115.65
Brill. Yellow H7G	332.30	Navy Blue M RB	318.75	Dark Blue 2R Powder Fine	389.25
Yellow M4R	243.95	Turquoise M-G	197.85	Blue BC Supra Disp.	359.40
Yellow M GR	326.05	Brill. Blue M GX	302.50	Jade Green XBN Powder Fine	438.20
Brill. Yellow M4G	177.10	Blue 3R Acra Powder	718.20	Jade Green XBN Acra	
Brill. Yellow M8G	332.30	Dark Brown H 6R	248.45	Conc. Powder	823.90
Yellow M 3R	217.60	Cobalt Oxide (per kg.)	285.00	Jade Green 2G Pdr. Fine	419.65
Brill. Orange H 2R	241.85	Green H 4BD	269.80	Jade Green 2G Ptg. Paste	125.40
Brill. Red H 7B	157.95	Green H-E4BI	169.80	Jade Green XBN Ptg. Paste	126.00
Brill. Orange M 2R	313.15	Red Brown H IF	143.25	Jade Green 2G Supra Disp.	496.00
Brill. Red H 8B	169.45	Orange Brown H 28	209.05	Olive Green B Pdr. Fine	399.90
Brill. Scarlet H RN	245.05	Brown M GRN	188.80	Olive D Pdr. Fine	444.30
Supra Red H-3BP	179.30	Black H-N	283.35	Olive Green B Supra Disp.	308.26
Brill. Red H-F3B	243.45			Jade Green XBN Supra	
Brill. Magenta HB	167.00	<b>SULFUR COLOURS</b>	<b>Per Kg.</b>	Disp. (N)	327.30
Brill. Red M 5B	98.90	Navy Blue	99.85	Olive OMW Pdr. Fine	698.55
Brill. Red M 8B	173.70	Green G	198.55	Olive OMW Supra Disp.	538.05
Brill. Pink MB	137.10	Black Grains Extra	63.05	Olive R. Pdr. Fine	422.96
Brill. Magenta MB	121.55	Black Grains OG	64.55	Olive D Supra Disp.	361.70
Brill. Purple H-3R	180.20	Black GXE Conc.	61.60	Olive R Supra Disp.	363.90
Brill. Purple H-7R	175.40	Black GXE	52.75	Olive D. Ptg. Paste	193.00
Navy Blue H 3R	298.50	Black GXR	61.60	Olive Green B. Ptg. Paste	199.10
Brill. Blue H-GR	366.55	Black Grains 800	54.20	Olive Green B Acra Conc.	542.75
Brill. Blue H 5G	173.10	Black EXR Grains	64.55	Olive R Acra Conc.	640.00
Blue H 5R	283.85	Black EXR Grains 800	51.25	Olive Green B Acra Conc.	542.75
Brill. Blue H 7G	178.70			Brown R Pdr. Fine	835.00
Brill. Blue H 7RX	358.15	<b>VAT COLOURS (ICI)</b>	<b>Per Kg.</b>	Brown G. Pdr. Fine	795.00
Turquoise HA	234.45	Yellow 5G Powder Fine	673.15	Brown R Pdr. Fine	659.75
Supra Blue H-3RP	335.70	Yellow 5G Supra Disperse	439.30	Dark Brown 3R Pdr. Fine	685.00
Supra Turquoise H 2GP	181.50	Yellow 5G Acra Con.	628.75	Brown G. Supra Disp.	449.90
Blue H-ERD	305.80	Yellow 3R Powder	588.85	Brown 2G Supra Disp.	554.00
Navy Blue H ER	258.60	Gold Orange 3G Pdr. Fine	952.15	Brown R Supra Disp.	422.95
Blue H 5RX	269.30	Brill. Orange 6R Pdr. Fine	624.35	Brown BR Powder	719.00
		Gold Orange 3G Supra Disp.	601.30	Dark Brown 3R Ptg. Paste	217.15
		Brill. Orange 6RX Powder	394.30	Dark Brown 3R Supra Disp.	414.55
		Brill. Red 3B Pdr. Fine	997.80	Brown G Acra Conc.	733.95
		Brill. Red 3B Supra Disp.	713.20	Brown R Acra Conc.	768.00
		Brill. Purple 4R Conc. Pdr.	470.75	Grey M. Powder Fine	768.80
		Brill. Purple 3R Acra Powder	690.85	Grey M. Supra Disp.	585.45
		Brill. Purple 2R Hly. Conc.	597.90	Blue BC Acra Conc. Pdr. Fine	762.70
		Brill. Purple 4R Supra Disp.	500.05	Direct Black AC Supra Disp.	330.35
		Brill. Purple 2R Acra Conc.	625.95	Direct Black AC Pdr. Fine	474.70
		Blue R Powder Fine	542.15	Direct Black CH Supra Disp.	393.20
		Blue BC Conc. Pdr. Fine	522.50	Direct ACD Ptg. Paste	217.15
		Blue BC Acra Conc. Pdr. Fine	762.70		



## Madras Market

Normal conditions prevailed in the market. Hydros prices continue to rule high. All liquid chemicals rates registered a nominal increase due to increase in prices of packing materials, both carboys and drums. Bleaching powder is under short supply due to low production at Mettur Chemicals

and the prices have also gone up. Diethylene Glycol was under great demand. Prices of solvents like cyclohexanone, MEK registered an increase due to seasonal demand. Ethylene oxide based products are also under short supply due to non-availability of raw materials.

### (MADRAS MARKET RATES AS ON JULY 2, 1988)

Acetic Acid — Glacial (per kg)	17.50	Hydrosulphite of Soda TCPL (per kg)	40.00
Acid Slurry (Soft) (per kg)	26.00	Hydrosulphite of Soda IDI (per kg)	44.00
Aluminium Sulphate Iron free (per tonne)	1,700.00	Hydrosulphite of Soda BASF (per kg)	44.00
Ammonium Bi-carbonate (per 25 kg.)	125.00	Hydrogen Peroxide (India) (per kg)	30.00
Ammonium Chloride SPIC (per tonne)	2,200.00	Hyflo Supercell	19.50
Bleaching Powder — Mettur (per 25 kg bags)	115.00	Magnesium Carbonate Light	18.00
Borax Granular	675.00	Potassium Bichromate (per kg)	26.00
Cresylic Acid 100% (per kg)	85+E.D.	Phosphoric Acid (per kg)	18.75
Meta Cresol 40/42% (per kg)	47.00+E.D.	Phthalic Anhydride (per kg)	24.00
Para Cresol 80/85% (per ton)	60+E.D.	Pentaerythritol (per kg)	52.00
Caustic Soda Flakes (Mettur) (per ton)	8,800.00	Paraffin Wax (per kg)	13.50
Caustic Soda Flakes (Andhra Sugar)	8,800.00	Oxalic Acid (per kg.)	20.00
Citric Acid — Indian (per kg)	50.00	Soda Ash (TAC) (per 75 kg)	315.00
Copper Sulphate (per 50 kg)	1000.00	Soda Ash (TATA) (per 75 kg)	315.00
Formic Acid (India) (per kg)	28.50	Sodium Cyanide Indian (per kg)	55.00
Formaldehyde (per kg)	10.00	Sodium Cyanide Degussa (per kg)	80.00
Glycerine (per kg)	42.00	Sodium Bichromate (per kg)	18.00
		Sodium Bicarbonate (per 50 kg)	280.00

Sodium Nitrite (per 50 kg)	750.00
Sodium Nitrate (per 50 kg)	425.00
Sodium Silicate (per tonne)	450.00
Sodium Sulphate (per tonne)	3500.00
Sodium Sulphide Flakes (per tonne)	13,000.00
Sodium Bi-sulphite (per 50 kg)	190.00
Stearic Acid (per kg)	32.00
Trisodium phosphate (per 50 kg)	370.00
Titanium Di-oxide Indian TTP (per kg)	48.00
Titanium Di-oxide Indian Rutile (per kg)	58.00
Urea Tech (per tonne)	2,800.00
Zinc Oxide (per kg.)	34.00
Zinc Chloride Powder (per kg.)	13.00
Zinc Sulphate (per tonne)	4,500.00
Di-octyl phthalate (per kg)	44.00
Di-butyl phthalate (per kg)	44.00
Hexamine (per kg)	30.00

### SOLVENTS

Acetone (I.O.C.) (per kg)	17.50
Isopropyl Alcohol NOCIL (per kg.)	21.50
Diacetone Alcohol NOCIL (per kg)	29.00
Benzene SAIL (per kg)	17.00
Diethylene Glycol NOCIL (per kg)	45.00
Butanol NOCIL (per kg)	34.50
Toluene SAIL (per litre)	14.00
Xylene IPCL (per litre)	15.00
Phenol HOC (per kg)	28.00
Turpentine (per litre)	16.50
Sorbitol (per kg)	35.00
Trichloroethylene MCIC (per kg)	23.50
Carbon Tetra Chloride (per kg)	15.50
Chloroform (per kg)	24.00
Methylene chloride (per kg)	24.00
Methyl Ethyl Ketone (per kg.)	42.00
Cellicsolve (per kg)	52.00
Triethanolamine (per kg)	23.50
Ethyl Acetate (per kg.)	22.00
Butyl Acetate (per kg)	38.00
Methanol (per litre)	10.00



## Delhi Market

DELHI : July 1st (NNS) — Tartaric acid suffered a fall of Rs 75 in the Delhi chemicals market during the week under review, owing to slack demand by local and upcountry consumers, says NNS. Menthol prices also slipped by Rs 7/10 while formic acid and titanium dioxide quoted higher by Rs 1/2 per kg on reduced inflow. Turnover was poor in dyes and colours.

Tartaric acid dropped by Rs 75 at Rs 6325 (per 50kg.) for want of support by stockists induced by onset of monsoon. Paraffin wax declined by Rs 20 at Rs 590 (per 50kg.) due to poor demand. Refined wax also drifted lower from Rs 710 to Rs 690 on buyers' apathy.

On reports of about 500-700 kg. of the commodity daily commenced from U.P. along with fall in demand by stockists, menthol flake, medium and bold declined sharply by Rs 7/10 at Rs 198 Rs 208 and Rs 215 (per kg.)

respectively, Mentha oil moved down from Rs 170 to Rs 157 and DMO ruled easy at Rs. 35 per kg.

Sodium hydro sulphite lacked support and reacted downward by Rs 2 at Rs 39 on poor sale caused by rains. Sufolight ruled at Rs 48 per kg. Chatkolight (China) in 40kg. Packing was sold at Rs 45 and in 50kg. packing at Rs 48.50 per kg. Rangolite (Germany) was stated at Rs 70.

Titanium dioxide spurted by Rs 2 at Rs 49.50 per kg. due to short supply and hope of improved demand by stockist paint makers. Titanium dioxide RC-822 softened by one at Rs 63 on easy supply. In the fresh import, formic acid edged up by rupee one at Rs 26. Soda ash, caustic soda, soda bicarb prices ruled quiet at their last week level. Ammonia bicarb slipped by Rs 3 at Rs 120 thanks to fresh offerings from Sindhari.

Turnover was poor in dyes and colour in inclement weather.

### (DELHI MARKET RATES 'AS ON JULY 1, 1988)

Ammonia Bicarb (per 25 kg)	120.00
Mercury (per flask)	10,250.00
Soda ash (per bag)	270-300.00
Ammonium chloride (per 50 kg)	125-180.00
Caustic soda solid	No Stock
Caustic soda flakes (per 50 kg)	403-404.00
Citric acid (per 50 kg)	2050-2400.00
Stable Bleaching Powder Shriram (per 25 kg)	95.00
Stable Bleaching Powder KCI (per 25 kg)	85.00
Stable Bleaching Powder MODI (per 25 kg.)	90.00
Sod. Bicarbonate (per 50 kg)	260-270.00
Sod. Hydro Sulphite (per kg)	39.43.00
Rangolite (per kg)	45-70.00

Boric acid Technical (per 50 kg)	1020.00
Paraffin wax (per 50 kg)	590.00
Tartaric acid (per 50 kg)	6,325.00
Borax Granular (per 50 kg)	575.00
Borax Crystal (per 50 kg)	600.00
Sodium Nitrate (per 50 kg)	450.00
Sodium Nitrite (per 50 kg)	750-775.00
Camphor Powder (per kg)	87.00
Camphor Thal (per kg)	97.00
Menthol Medium (per kg)	208.00
Menthol Flakes (per kg)	198.00
Menthol Bold (per kg)	215.00
Glycerine (per kg)	42-43.00
Sodium Silicate (per quintal)	200-250.00
Hexamine (per kg)	42.00
Acetic Acid Glacial (per kg)	13-13.50
Copper Sulphate (per quintal)	1900-2200.00

Formic acid (per kg)	26.00
Formaldehyde (per kg)	8.00
Hydrogen Peroxide (per kg)	30-32.00
Calcium Carbonate (per tonne)	2500-4000.00
Acid Slurry Soft (per kg)	24.00
Acid Slurry Hard (per kg)	32.00
Phosphoric Acid (per 50 kg)	825.00
Pot. Nitrate (per quintal)	900-1200.00
Pot. Permanganate (per 50 kg)	2300.00
Sod. Bichromate (per 50 kg)	1050-1150.00
Tri-Sod. Phosphate (per 50 kg)	325-360.00
Titanium Dioxide Anatase (per kg)	.49.50
Titanium RC-822 (per kg)	63.00
Zinc Oxide (per mt)	32,000-40,000.00
Phenol Carbolic Acid (per kg)	33.00
Carbon Tetrachloride (per kg)	19.00
Chloroform (per kg)	28.00
Sodium Sulphate (per 50 kg)	160-170.00
Naphthalene Balls (per 50 kg)	1400.00

### DYES & COLOURS per kg

Naphthol AS	150.00
Naphthol ASG	235.00
Naphthol ASBS	200.00
Naphthol ASTR	302.00
Naphthol ASOL	191.00
Naphthol ASBO	208.00

### DIRECT DYES (per kg)

Black E. Conc.	92-155.00
Diazo Black B.T.	125.00
Green B.	119.00
Blue 2-B	86.00
Sky Blue FB	200.15
Basic Auramine O' Conc.	55-100.00
Basic Rhodamine B.500%	220-320.00
Basic Methylene Blue	92-130.00
Basic Violet	142-160.00
Basic Malachite Green	160-185.00
Acid Orange	45-52.00



## Materials Imported

### BOMBAY

From 3.2.88 to 5.2.88

**TITANIUM DIOXIDE RU-TILE GRADE:** From UK: U.K. Paint Inds., 40 Mts., Rs. 11,45,122.

**TITANIUM TRICHLORIDE:** From Japan: Indian Petrochemicals Corpn., Ltd., 6,500 kgs., Rs. 6,04,905; From U.K.: Super Urecoat Inds. Ltd., 4,770 kgs., Rs. 90,217.

**TOLUENE DIISOCYANATE DESMODUR T 80:** From FRG: Converter. Adhesives & Chemicals, 2,000 kgs., Rs. 55,828.

**TRIDECYL ALCOHOL:** From UK: Sandoz India Ltd., 16,856 kgs., Rs. 3,44,046.

**TRIETHYL ALUMINIUM:** From FRG: Schering Aktiengesellschaft, 7.8 Mts., Rs. 6,78,302.

**TRIETHYLENE GLYCOL:** From Japan: Jagatjit Cotton Textile Mills, 2,025 kgs., Rs. 38,333; From Taiwan: Tata Exports Ltd., 4,950 kgs., Rs. 62,982.

**TRIMETHALIC ANHYDRIDE:** From USA: Dr. Beck & Co (I) Ltd., 16,329 kgs., Rs. 4,81,419.

**TRIMETHOXY BENZALDEHYDE:** From France: Orex Pharma Pvt. Ltd., 1,000 kgs., Rs. 2,98,615; Burroughs Wellcome (India) Ltd., 2,200 kgs., Rs. 6,28,389.

**TRIMETHYL CHLOROSILANE:** From Japan: Hico Products Ltd., 12,000 kgs., Rs. 8,17,945.

**1,3,3 TRIMETHYL INDOLINE:** From Japan: Diamond Dyes & Chemicals, 400 kgs., Rs. 94,650.

**TRIMETHYL METHYLENE INDOLINE FISCHERS BASE:** From UK: Supreme Dyes Corpn., 500 kgs., Rs. 1,25,001.

Chemical Indus. 95,350 Mts., Rs. 25,67,514.

**TRIMETHYL PROPANE:** From Sweden: Garware Paints Ltd., 13,000 kgs., Rs. 3,03,808.

**TRIOCTYL TINMELITATE:** From UK: Asian Cables Corpn Ltd., 31,200 kgs., Rs. 10,28,708.

**TUNGSTON CARBIDE POWDER:** From FRG: Sandvik Asia Ltd., 500 kgs., Rs. 1,32,214.

**VANILLIN (Technical):** From France: Ven petrochem & Pharm (I) Ltd., 9,150 kgs., Rs. 11,28,569.

**VINYL ESTER OF VERSATE 10:** From Netherlands:

Asian Paints India Ltd., 14,274 kgs., Rs. 2,77,984.

**VINYL ESTER OF VERSATE 10:** From Netherlands: PDI Chemicals P. Ltd., 4,941 kgs., Rs. 1,02,640.

**VINYL RESIN:** From USA: Pyrene — Rai Metal Treatments Ltd., 260.8 kgs., Rs. 53,124.

**VINYL RESIN SOLN.:** From USA: JBA Printing Inks Ltd., 4,500 Lbs., Rs. 2,71,967.

**2,3 XYLIDINE:** From Japan: Supra Chemicals, 1,600 kgs., Rs. 64,783.

**ZINC OXIDE:** From FRG: Enkay (India) Rubber Co. Pvt. Ltd., 2,000 kgs., Rs. 29,146.

## Plastic Materials Imported

### BOMBAY

From 3.2.88 To 5.2.88

**EMPS RESIN GRADE:** From Korea: NM. Nagpal Pvt. Ltd., 12 Mts., Rs. 2,35,545.

**HDPE:** From Czechoslovakia Associated Brothers, 12.5 Mts., Rs. 1,02,009; From Germany: Prestige HM Polycontainers Ltd., 53,875 kgs., Rs. 91,980; From Japan: Kanpur Plastipack Ltd., 100 Mts., Rs. 15,32,444; Sumitra Plastics Ltd., 33 Mts., Rs. 5,18,471; 100 Mts., Rs. 12,44,902; From Saudi Arabia: Associated Bros., 99 Mts., Rs. 12,14,646; Hemant Development Corp., 17,150 kgs., Rs. 2,14,869; Jaydex Packaging, 17,150 kgs., Rs. 2,14,869; Krishna Pack, 17,150 kgs., Rs. 2,14,870.

**HDPE BLOW MOULDING GRADE:** From Saudia Arabia: Crisana Synthetics Pvt. Ltd., 25 Mts., Rs. 3,37,565; From Yugoslavia: Cheta Corporation, 45 Mts., Rs. 4,83,756.

**HDPE MOULDING POWDER:** From Japan: The Supre-

**HIGH DENSITY POLYSTYRENE:** From Korea: Vidyut Metallics Ltd., 17 Mts., Rs. 3,20,037.

**HIGH IMPACT POLYSTYRENE:** From Korea: Calcom Electronics P. Ltd., 34 Mts., Rs. 6,47,903.

**HIGH IMPACT POLYSTYRENE (POLYSTROL):** From Korea: Vidyut Metallics Ltd., 17 Mts., Rs. 3,20,037.

**HIGH IMPACT POLYSTYRENE:** From Korea: Vidyut Metallics Ltd., 27 Mts., Rs. 3,20,037; Xpro India Ltd., 17 Mts., Rs. 3,23,347.

**LDPE:** From FRG: The Paper Products Ltd., 49.5 Mts., Rs. 6,10,537; From Yugoslavia: Bihari Plastic Udyog, 50 Mts., Rs. 6,18,994.

**LINEAR HYDROXYL POLYURETHANE:** From FRG: Nebula Chemicals Pvt. Ltd., 2000 kgs., Rs. 1,49,108.

**LLDPE:** From Hong Kong: Muthi Films Plastics Pvt. Ltd., 32 Mts., Rs. 4,27,928; From Saudia Arabia: M/s. Climax



LLDPE RESIN: From Canada: Kay Packagings Pvt. Ltd., 32 Mts., Rs. 4,30,005.

MEDIUM DENSITY POLYETHYLENE: From Belgium: Upcorn Cables Ltd., 30,000 kgs., Rs. 4,28,447; From Sweden: Karnataka Telecables Ltd., 6,500 kgs., Rs. 9,53,619.

POLYETHYLENE MOULDING GRADE: From FRG: Albert David Ltd., 15,000 kgs., Rs. 2,50,557.

POLYPROPYLENE: From Czechoslovakia: Associated Plastic Inds., 14 Mts., Rs. 1,62,208; Mehta Traders, 14 Mts., Rs. 1,32,587; From France: Cosmo Films Ltd., 32,500 kgs., Rs. 7,39,274; From Singapore: Deekay Electronics (India) 32 Mts., Rs. 5,56,722.

POLYSTYRENE: From Korea: Chhya Plastics, 17 Mts., Rs. 3,24,451; Indl. Resins Mfg. Co., 34 Mts., Rs. 6,22,418; Rajdhani Plastics, 17 Mts., Rs. 3,11,208; 34 Mts., Rs. 6,48,902; Sharad Plastics, Rs. 6,22,418; Shree Tirumala Udyog, 51 Mts., Rs. 9,33,624; Tata Exports Ltd., 34 Mts., Rs. 6,48,902; Uniplast Inds., 34 Mts., Rs. 6,48,902; From Mexico: Dev Plastics Inds., 10 Mts., Rs. 1,43,371; Devas Plastic, 20 Mts., Rs. 2,86,742; Kundan Plastic Inds., 20 Mts., Rs. 2,86,742; Paras Plastics, 10 Mts., Rs. 1,43,371.

POLYSTYRENE MOULDING POWDER: From Korea: Dilip Industries, 17 Mts., Rs. 3,11,208.

POLYSTYRENE RESIN GRADE: From Korea: Steriplate P. Ltd., 102 Mts., Rs. 19,13,294.

PTFE: From Japan: Fluoropolymer Processors, 500 kgs., Rs. 69,785.

PTFE DISPERSION: From UK: Bombay Fluoroplast P. Ltd., 50 kgs., Rs. 12,754.

PTFE RESIN: From Italy:

250 kgs., Rs. 31,647.

PVC: From Japan: Anil Processing Works, 1,000 kgs., Rs. 20,774.

PVC RESIN: From Australia: Willard India Ltd., 18 Mts., Rs. 3,60,000; From Japan: Chlorde India Ltd., 12 Mts., Rs. 2,52,401; From Korea: Royal Cushion Vinyl Prod. P. Ltd., 15 Mts., Rs. 2,28,451; From Saudia Arabia: Ashish Chemo-plast Equipment, 74.250 Mts., Rs. 9,35,085; From Yugoslavia: Omniplast Bombay Pvt. Ltd., 90 Mts., Rs. 10,14,304; Plastotex Pvt. Ltd., 90,000 kgs., Rs. 10,26,091; 90,000 kgs., Rs. 10,14,304.

PVC RESIN BATTERY SEPARATOR GRADE: From Yugoslavia: Mohanrams, 9.6 Mts., Rs. 1,21,661.

PVC RESIN PASTE GRADE: From Korea: Aarti Leathers Pvt. Ltd., 25 Mts., Rs. 3,80,749. Nathan Lthr Clth Mfg. Co. P. Ltd., 100 Mts., Rs. 14,98,582.

PVC PASTE RESIN: From Korea: Lucky Plast P. Ltd., 45 Mts., Rs. 6,79,442.

PVC RESIN SUSPENSION GRADE: From Brazil: Caprihan India Ltd., 400 Mts., Rs. 50,28,728; From Korea: Ajanta Tubes Ltd., 150 Mts., Rs. 19,55,121; Ancampa, 50 Mts., Rs. 7,02,418; Crystal Containers, 25 Mts., Rs. 3,38,145; Dynamic Pipes Pvt. Ltd., 100 Mts., Rs. 13,71,389; J.K. Leathers P. Ltd., 100 Mts., Rs. 13,12,931; Kunda-lia Inds., 150 Mts., Rs. 19,54,209; Purti Pipes & Processors P. Ltd., 150 Mts., Rs. 19,55,682; Wel Pack Industries, 25 Mts., Rs. 3,36,337; From Yugoslavia: Deltan Cables Ltd., 50 Mts., Rs. 6,10,213; Jain Tube Company Ltd., 100 Mts., Rs. 12,20,425; Kanchan Pipes P. Ltd., 25 Mts., Rs. 3,05,106; Marvel Vinyl P. Ltd., 50 Mts., Rs.

Rs. 3,05,106; Unipalas India Ltd., 200 Mts., Rs. 24,40,850.

## DYES MATERIALS IMPORTED BOMABY

(From 1.2.1988 to 5.2.1988)

BASONYL BLUE 636: From FRG: Kwality Chemical Inds., 100 kgs., Rs. 45,914.

CHROME OXIDE GREEN: From FRG: Jai Electronic Inds. P. Ltd., 25 kgs., Rs. 2,241.

DISPERSE DYESTUFF: From Korea: Jalan Woollen Inds., 2,750 kgs., Rs. 1,10,656.

NEOZAPON BLUE 807: From FRG: Graphic Arts., 150 kgs., Rs. 58,482.

OPTICAL WHITENING AGENT: From FRG: Amijay Elastic Processors Pvt. Ltd., 490 kgs., Rs. 76,443; Shree Prakash Textile (G) P. Ltd., 180 kgs., Rs. 73,405.

REFLEX BLUE: From FRG: JBA Printing Inks Ltd., 200 kgs., Rs. 24,149.

SULPHUR BLUE BR: From China: Shree Krishna Dyeing & Printing; 2,175 kgs., Rs. 91,715.

SULPHUR BORDEAUX 3B: From China: Shree Krishna Dyeing & Printing, 1,000 kgs., Rs. 68,162.

SULPHUR BROWN GDR: From China: Shree Krishna Dyeing & Printing, 1,825 kgs., Rs. 49,758.

SULPHUR SKY BLUE CL: From China: Blue Chip Dyestuff Ind. P. Ltd., 250 kgs., Rs. 14,607.

SULPHUR YELLOW: From China: Blue Chip Dyestuff Inds. Pvt. Ltd., 250 kgs., Rs. 5,843.

SULPHUR YELLOW BROWN 5G: From China: Blue Chip Dyestuff Inds., Pvt. Ltd., 1,000 kgs., Rs. 20,774.

SYNTHETIC ORGANIC DYE-STUFF: From China: SF Chem Inds. P. Ltd., 1,000 kgs., Rs. 20,500.



SYNTHETIC ORGANIC DYE-STUFFS SAMARON BRILL. PINK 5 BN: From FRG: Vibgyor Distributors, 150 kgs., Rs. 47,299.

SYNTHETIC RESIN: From Japan: Shree Krishna Dyeing & Printing, 5,000 kgs., Rs. 1,03,866; From U.S.A.: Finolex Cables Ltd., 52,992 Lbs., Rs. 4,15,178; Poly Dyechem Street, 12 Mts., Rs. 2,29,804.

WATER SOLUBLE DYE-STUFFS: From Japan: Joshi Formulates Pvt. Ltd., 240 kgs., Rs. 1,12,124.

#### DRUGS MATERIALS IMPORTED BOMBAY

From 1.2.88 To 5.2.88

ANALGIN DAB 8: From China: IPCA Laboratories Pvt. Ltd., 1,500 kgs., Rs. 1,30,481.

CALCIUM D PANTOTHENATE USP XX: From UK: Bombay Pharma Products, 500 kgs., Rs. 87,637.

CALCIUM D PANTOTHE-NATE USP/IP: From UK: Pfizer Ltd., 1,000 kgs., Rs. 1,94,749.

CHLORMEZANONE: From UK: Win Medicare Ltd., 100 kgs., Rs. 68,259.

NITRAZEPAM BP 80: From Hungary: The Anglo Frech Drug Co. Ltd., 50 kgs., Rs. 89,894.

SORBITOL 70% SOLUTION: From FRG: Unique Pharmaceutical Labs., 57.12 Mts., Rs. 3,15,181.

THEOPHYLINE ANHYD-ROUS: From FRG: German Remedies Ltd., 3,000 kgs., Rs. 6,33,099.

#### MATERIALS IMPORTED MADRAS

From 27.1.88 To 5.2.88

ACETONITRILE: From Japan: NOCIL, 24,000 kgs., Rs. 3,08,146.

ACETYL CHLORIDE: From FRG: Cheminor Drugs Pvt. Ltd., 31.2 Mts., Rs. 5,42,068.

ACRYLIC ACID: From Japan: Southern Polymers Pvt. Ltd., 16,000 kgs., Rs. 3,36,167.

ALPHA OLEFIN SULPHON-ATE: From France: Chemicals and Plastics India Ltd., 36,000 kgs., Rs. 3,91,166.

ALUMINIUM OXIDE: From FRG: Carborundum Universal Ltd., 3,500 kgs., Rs. 66,191.

ANTIMONY TRIOXIDE: From Japan: W.S. Insulators of India Ltd., 150 kgs., Rs. 24,017.

BENZALDEHYDE: From Netherlands: Malladi Drugs & Pharmaceuticals Ltd., 2,600 kgs., Rs. 68,963.

BENZOYL PEROXIDE: From Japan: India Nippon Electricals Ltd., Rs. 1,811.

BISMUTH OXIDE: From Japan: W.S. Insulators India Ltd., 300 kgs., Rs. 1,09,168.

CALCIUM PANTOTHENATE USP: From FRG: Rasiklal & Sons, 1,000 kgs., Rs. 1,78,534.

CARBOFURAN: From USA: Rallis India Ltd., 9 Mts., Rs. 14,69,526.

CARBON BLACK: From FRG: Shriram Fibres Ltd., 50 kgs., Rs. 6,282.

CARBON BLACK POWDER: From Switzerland: Associated Paint Industries, 8.20 kgs., Rs. 379.

CARBON GRANULAR: From FRG: ITI Ltd., 240 kgs., Rs. 2,67,356.

CEDRENYL ACETATE LI-QUID: From UK: Padmini Products, 525 kgs., Rs. 1,20,194.

3-CHLORO 4-FLUORO ANI-LINE: From UK: Tamil Nadu Pharmaceuticals Ltd., 200 kgs., Rs. 96,514.

CHLORO TRIFLUORODI-BROMO ETHANE: From UK: I.E.L. Ltd., 4,000 kgs., Rs. 1,77,555.

CHLORO TRIFLUORO DI-BROMO METHANE: From UK: I.E.L. Ltd., 6,000 kgs., Rs. 2,66,331.

CHROMIUM OXIDE: From Japan: W.S. Insulators of India Ltd., 75 kgs., Rs. 8,870.

COBALT OXIDE: From Japan: W.S. Insulators of India Ltd., 705 kgs., Rs. 49,126.

DESMODUR T. 80: From Belgium: Flexible Foams Pvt. Ltd., 5,500 kgs., Rs. 1,53,360.

DESMODUR: From FRG: D.P. Foam P. Ltd., 5,250 kgs., Rs. 1,46,389; Flexible Foams Pvt. Ltd., 8,500 kgs., Rs. 2,37,000; Jay Foam Pvt. Ltd., 6,250 kgs., Rs. 1,73,311; From Belgium: U. Foam Pvt. Ltd., 5,500 kgs., Rs. 1,53,366.

DI ETHYL ANILINE: From USA: Siris India Ltd., 13,880 Mts., Rs. 3,70,882.

DI ETHYL SULPHATE: From Japan: I.E.L. Ltd., 2,600 kgs., Rs. 80,538.

DIMETHYL FORMAMIDE: From US: I.E.L. Ltd., 4,095 kgs., Rs. 62,742.

DIMETHYL SULPHOXIDE: From Japan: Jupiter Org. Pvt. Ltd., 1,320 kgs., Rs. 32,698.

EPOXY RESIN: From Japan: Al-Ameen Commercial & Indl., 45 kgs., Rs. 5,369; Al-Ameen Commercial & Indl., 185 kgs., Rs. 20,065; Suchitra Components Ltd., 860 kgs., Rs. 64,387; From Singapore: Electronics Research Pvt. Ltd., 1,180 kgs., Rs. 59,572; Suchitra Electronics Pvt. Ltd., 3,900 kgs., Rs. 1,77,028.

ETHOXY METHYLENE MA-LONATE: From FRG: Tamil Nadu Dadha Pharmaceuticals Ltd., 200 kgs., Rs. 30,348.

ETHYL ACETOACETATE: From FRG: TTK Chemicals Ltd., 3,000 kgs., Rs. 89,487.

ETHYL DIGLYCOL TECHNICAL: From FRG: Bush Boake Allen (I) Ltd., 1 kg., Rs. 200.



ETHYL HYDROXY ETHYL  
CELLULOSE: From Belgium:  
Masad Production Pvt. Ltd., Rs  
726.

ETHYL HEXYLADIPATE:  
From FRG: Chemicals and Plas-  
tics India Ltd., 15,210 kgs., Rs.  
42,915.

FURFURYL ALCOHOL: From  
Belgium: Coromandel Prodo-  
te Ltd., 6 Mts., Rs. 1,31,658.

GUANICILINE CARBON-  
TE: From Australia: I.E.L.  
Ltd., 1,600 kgs., Rs. 1,20,459.

GUM BENZOIN: From Sin-  
gapore: .K. Krishna Pandaran  
& Sons, 859 kgs., Rs. 14,696; K.  
Palaniswamy & Co., 853 kgs.,  
Rs., 14,594; Union Trading Co.,  
424 kg., Rs. 23,816.

GUM ROSIN: From Singa-  
pore: Ambica Chemical Prods.,  
7,100 kgs., Rs. 1,37,050.

HYDROFLUORIC ACID:  
From USA: BEL, 1,320 Lbs.,  
Rs. 26,675.

HYDROXY ACETIC ACID:  
From FRG: Chemicals & Plas-  
tics India Ltd., 225 kgs., Rs.  
6,374.

HYDROXYLAMINE SUL-  
PHATE: From Japan: Anandy  
Laboratories Ltd., 10 Mts., Rs.  
2,90,890; Dakshin Pharmaceuti-  
cals Ltd., 17,500 kgs., Rs.  
4,91,776; Standard Organics  
Ltd., 17.5 Mts., Rs. 4,96,372;  
From Netherlands: South India  
Research Inst., 20 Mts., Rs.  
5,40,293.

INSOLUBLE SULPHUR:  
From Japan: Malabar Tyres &  
Rubber, 3 Mts., Rs. 60,307.

ISOPROPYL ALCOHOL:  
From Netherlands: Cheminor  
Drugs (P) Ltd., 38.376 Mts., Rs.  
3,00,611; Dr. Reddy's Laborato-  
ries Ltd., 12.792 Mts., Rs.  
1,00,204; From Taiwan: Shasun  
Drugs, 12,800 kgs., Rs. 1,04,085.

LACTOSE: From Nether-

kgs., Rs. 1,63,612; Medopharm,  
7,000 kgs., Rs. 84,740.

LACTOSE BP/USP: From  
Netherlands: Tamil Nadu Da-  
dha Pharmaceuticals Ltd., 18  
Mts., Rs. 2,14,651.

LACTOSE USP: From Ne-  
therlands: Medopharm, 12,000  
kgs., Rs. 1,45,270.

LINALOL: From FRG: Bush  
Boake Allen Ltd., 700 kgs., Rs.  
46,061.

LINALYL ACETATE: From  
FRG: Bush Boake Allen Ltd.,  
700 kgs., Rs. 52,761.

MANGANESE CARBONATE:  
From Japan: W.S. Insulators of  
India Ltd., 80 kgs., Rs. 4003.

MERCAPTO BENZIMIDAZ-  
OLE: From Japan: Shriram  
Fibres Ltd., 1,750 kgs., Rs.  
2,66,570

MERCAPTO ETHANOL: From  
FRG: Chemicals and Plastics  
India Ltd., 200 kgs., Rs. 12,209.

DL-METHIONINE: From Ja-  
pan: Sunnex Commercial Pvt.  
Ltd., 2,000 kgs., Rs. 77,815.

METHYL ACETO ACETATE:  
From USA: Shasun Chemicals  
Pvt. Ltd., 37,440 Lbs., Rs.  
2,90,852.

METHYL DI ISOCYANATE:  
From Switzerland: Karnataka  
Soaps & Detergents, 400 kgs.,  
Rs. 1,68,907.

METHYL ETHYL KETONE:  
From FRG: Madras Refineries  
Ltd., 59,850 kgs., Rs. 7,38,126;  
From Netherlands: K. Uttamlal  
Pvt. Ltd., 14,400 kgs., Rs.  
1,51,272.

MONOCROTOPHOS DDVP  
Tech: From Singapore: Tropi-  
cal Agrosystems P. Ltd., 8,750  
kgs., Rs. 3,87,127; 8,750 kgs., Rs.  
3,94,758.

NEOPENTYL GLYCOL: From  
Japan: South India Research  
Inv't., 15 Mts., Rs. 2,67,098.

PENTOSE: From FRG: Mc.  
Dowells Ltd., 148 kgs., Rs.  
62,007.

PHENOBARBITONE BP 80:  
From Hungary: Medopharm,  
150 kgs., Rs. 25,971.

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**PHENOLATE TECHNICAL:**  
From Japan: Coromandel Products P. Ltd., 15,000 kgs., Rs. 9,31,904.

**PHENOL:** From FRG: I.E.L. Ltd., 9010 kgs., Rs. 12,04,738.

**PHENOLIC RESIN:** From Japan: Al-Ameen Commercial & Indl., 20 kgs., Rs. 2,169.

**PHOSPHORIC ACID:** From Moraco: Madras Fertilizers Ltd., 4,369,681 Mts., Rs. 2,18,32,882.

**POLYVINYL ALCOHOL:** From Japan: Coastal Tanners. 50 Mts., Rs. 10,31,678.

**PROPYLENE GLYCOL:** From USA: Naptha Resins & Chemicals, 17,200 kgs., Rs. 1,78,455.

**PROPYLENE GLYCOL USP:** From Singapore: Veeyor Formulators, 5160 kgs., Rs. 60,906; From USA: Bush Boake Allen Ltd., 51,600 kgs., Rs. 5,45,401.

**PROPYLENE OXIDE:** From FRG: Newland Laboratories Ltd., 1.12 Mts., Rs. 39,085.

**PURIFIED TEREPHTHALIC ACID:** From Spain: Indian Or-

ganic Chemicals Ltd., 21,000 kgs., Rs. 1,68,103.

**SODIUM FORMATE:** From Japan: T.N. Chemical Products Ltd., 105 Mts., Rs. 4,49,378.

**SODIUM METAL:** From FRG: Prasad Drugs Pvt. Ltd., 2,576 Mts., Rs. 65,814.

**STYRENE OXIDE:** From Japan: I.E.L. Ltd., 3,400 kgs., Rs. 1,38,458.

**SYNTHETIC RESIN:** From USA: Tamil Nadu Dadha Pharm. Ltd., 450 Lbs., Rs. 34,338.

**TERT. BUTYL ALCOHOL:** From Japan: Maschemeijer Aromatics Ltd., 12.4 Mts., Rs. 2,28,359.

**TERT. BUTYL PEROXIDE:** From FRG: Addisons Paints & Chemicals Ltd., 120 Lts., Rs. 47,581.

**TETRA ETHYL LEAD:** From UK: Indian Oil Corpn., 99,918 Mts., Rs. 50,25,825.

**TETRAHYDROFURAN:** From Singapore: Prakash Pipes &

Inds. Ltd., 23,941.82 kgs., Rs. 6,37,832.

**TRICHLORO ETHYLENE:** From Japan: Wheels India Ltd; 21 Mts., Rs. 2,96,370.

**3,4,5 TRIMETHOXY BENZALDEHYDE:** From China: Medispan Ltd., 1,000 kgs., Rs. 2,77,863; From Japan: Plant Organic Ltd., 1.02 Mts., Rs. 3,05,048.

**VANILLIN:** From France: Bush Boake 180 Mts., Rs. 8,17,052.

**VIRGIN MERCURY:** From China: The Andhra Sugars Ltd., 200 Nos., Rs. 7,65,176.

**WHITE ALUMINIUM OXIDE:** From FRG: Carborundum Universal Ltd., 2,000 kgs., Rs. 46,010.

**ZINC OXIDE POWDER:** From Japan: W.S. Insulators India Ltd., 10,000 kgs., Rs. 3,46,376.

#### **PLASTIC MATERIALS**

##### **IMPORTED**

##### **MADRAS**

**From 27.1.88 To 5.2.88**

**HDPE:** From Japan: Sanjeevini Enterprises; 20 Mts., Rs. 2,40,103; S. S. Laminates Pvt., Ltd., 25 Mts., Rs. 2,99,657; Sivasini Filaments 20 Mts., Rs. 2,40,103; From Saudi Arabia: B.N. Shah, 17.15 Mts., Rs. 2,12,410; B.M. Shah, 17.15 Mts., Rs. 2,16,860; Century Household Indus, 17,150 kgs., Rs. 2,12,411; Plastometal, 17.15 Mts; Rs. 2,12,441; From Singapore: Polyspin Pvt. Ltd., 48,000 kgs., Rs. 7,58,482; From Yugoslavia: Blow Plast Indus., 16,000 kgs., Rs. 1,51,998.

**POLYPROPYLENE:** From France: M.M. Rubber Co. Ltd., 48,750 kgs., Rs. 9,97,828; From Japan: Simco Engineering Co. Ltd., 5,000 kgs., Rs. 1,66,722.

**POLYPROPYLENE FILM:** From Singapore: Hindustan Plastics., 10 Mts., Rs. 2,55,726.

**POLYURETHANE EMULSION:** From Spain: Sreenivasa & Co. 240 kgs. Rs. 12,150.

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ISO Propylamine

N Heptane \* Sorbitol

Butanol-N/Iso

Carbon Tetra Chloride

Carbon Di-Sulphide

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